University of Santa Clara

Catalogue

1914-1915

SANTA CLARA, CALIFORNIA
1914

UNIVERSITY OF SANTA CLARA

APPLICATION BLANK

UNIVERSITY OF SANTA CLARA

APPLICATION BLANK

Date .....

Day, year, and place of birth .....

Present address .....

Name and address of parent or guardian .....

What college do you desire to enter? .....

Can you fulfill the prescribed units? .....

Schools formerly attended .....

State last grade ..... Promoted or not? .....

State work satisfactorily done in the following subjects:

SUBJECT	No. of Hours per Week that class was held	Length of Time the Subject was followed	Grades Attained
Latin			
Greek			
English			
French			
German			
Spanish			
Ancient History			
Medieval History			
Modern History			
American History			
Chemistry			
Physics			
Algebra			
Geometry			
Trignometry			

State other work accomplished .....

.....

Were you honorably dismissed from the school last attended? .....

NOTE—Wherever possible, the applicant should procure a certified statement from the schools he has attended, giving the information requested above, as well as all other information touching upon his school work, his reputation for industry and good morals.

SENIOR HALL, UNIVERSITY OF SANTA CLARA, LOOKING SOUTH

University of Santa Clara

CATALOGUE

1914-15

The Corporate Title of the University is

THE PRESIDENT AND BOARD OF TRUSTEES OF SANTA CLARA COLLEGE

BOARD OF TRUSTEES

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EXECUTIVE BOARD

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San Jose, Cal.

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CALENDAR

1914.

Sept. 2, Wednesday.	Registration of non-resident students, 9 a. m. Registration of resident students, 1:30 p. m. (Fee for late registration $1.00.)
Sept. 3, Thursday.	Examinations begin for removal of conditions. 2:30 p. m. Classes begin. 6:55 p. m. Classes begin in Institute of Law.
Sept. 7, Monday.	Labor Day; a holiday.
Nov. 25, Wednesday.	Thanksgiving recess begins at noon.
Nov. 30, Monday.	Thanksgiving recess ends at 6 p. m.
Dec. 8, Tuesday.	Feast of the Immaculate Conception; a holiday.
Dec. 9, Wednesday.	Examinations begin for students who were conditioned in the final tests before graduation.
Dec. 21, Monday.	Christmas vacation begins at 3:30 p. m.

1915.

Jan. 4, Monday.	Christmas vacation ends at 6 p. m.
Jan. 14, Thursday.	Repetitions begin in all classes.
Jan. 25, Monday.	Mid-year examinations begin.
Feb. 1, Monday.	Second semester begins.
Feb. 14, Sunday.	Students' Retreat begins at 6:20 p. m.

Feb. 18, Thursday.	Students' Retreat ends; a holiday.
Feb. 22, Monday.	Washington's Birthday; a legal holiday.
Mar. 15, Monday.	Last day to submit subjects for graduation theses in all departments.
Mar. 16, Tuesday.	Entertainment at 8 p. m.
Mar. 19, Friday.	St. Joseph's Day; a holiday.
Mar. 26, Friday.	Examinations begin for removal of conditions.
Mar. 30, Tuesday.	Elocution Contest.
Mar. 31, Wednesday.	Easter vacation begins at 3:30 p. m.
Apr. 7, Wednesday.	Easter vacation ends at 6 p. m.
Apr. 20, Tuesday.	Last day to send in essays for Redwood prizes. Archbishop's Medal Contest in Christian Doctrine.
Apr. 27, Tuesday.	Donohoe Prizes Contest in Latin and Greek Composition.
May 1, Saturday.	Last day to hand in Essays for McCann prizes.
May 4, Tuesday.	Ryland Debate.
May 11, Tuesday.	Barchi Medal Contest in Mathematics.
May 13, Thursday.	Feast of the Ascension; a holiday.
May 14, Friday.	Last day to submit theses in Law.
May 18, Tuesday.	Repetition in all classes begin.
May 28, Friday.	Written examinations begin.

June 1, Tuesday.	Oral examinations for Seniors begin.
June 3, Thursday.	Feast of Corpus Christi; a holiday.
June 4, Friday.	Written examinations in Freshman Letters and Engineering begin.
	Examinations begin in High School.
June 5, Saturday.	Oral examinations in Law begin.
June 9, Wednesday.	Commencement Day.

FACULTY OF THE UNIVERSITY

WALTER FRANCIS THORNTON, S. J.
President.

JOSEPH THOMAS MORTON, S. J.
Vice-President and Director of Discipline.

RICHARD HENRY BRAINARD, S. J.
Secretary and Treasurer.

CORNELIUS ALOYSIUS BUCKLEY, S. J.
Dean of the Faculties; Director of Studies; Faculty Moderator of "The Redwood"; President of the Senate.

HENRY WELCH, S. J.
Chaplain; Director of the Sodality of the Immaculate Conception; Speaker of the House.

ANTHONY CICHI, S. J.
Emeritus Professor of Chemistry.

JEROME SIXTUS RICARD, S. J.
Professor of Ethics and Theodicy; Director of the Astronomical, Meteorological and Seismological Observatory.

WILLIAM MICHAEL BOLAND, S. J.
Professor of Logic, Metaphysics, Psychology, and Political Economy.

RICHARD HENRY BELL, S. J.
Librarian; Professor of Physics and Calculus.

PAUL FRANCIS GALTES, S. J.
Professor of Inorganic Chemistry and Trigonometry.

PATRICK HUGH DEIGNAN, S. J.
Professor of English and Latin.

HENRY LOUIS WALSH, S. J.
Instructor in English, Latin and Geometry.

FACULTY OF UNIVERSITY

LAWRENCE EMMETT O'KEEFFE, S. J.
Registrar; Professor of Law; Director of The Saint John Berchman's Sanctuary Society for Extern Students.

JOHN HENRY McCUMMISKEY, S. J.
Professor of English, Latin and Greek.

ALPHONSE JUNIPERO QUEVEDO, S. J.
Professor of Higher Algebra, Trigonometry and Calculus.

ERNEST PAUL WATSON, S. J.
Professor of English and Greek; Moderator of Junior Athletics.

EDWARD ALOYSIUS McNAMARA, S. J.
Professor of English and Inorganic Chemistry.

EDWARD JAMES CUNNINGHAM, S. J.
Instructor in Physics and History; Director of Music.

JOSEPH RANDALL CROWLEY, S. J.
Instructor in Latin, English and History.

EDWARD JOSEPH WHELAN, S. J.
Instructor in Latin, English and History; President of The Junior Dramatic Society; Director of The Saint John Berchman's Sanctuary Society for Resident Students.

ARTHUR VINCENT COGHLAN, S. J.
Instructor in Latin and English; Director of the University Choir.

SILVERIUS ALOYSIUS ELINE, S. J.
Instructor in Latin and English; Faculty Moderator of Athletics.

LOUIS BENJAMIN EGAN, S. J.
Instructor in English, Latin and Algebra.

JAMES HENRY CAMPBELL, Ph. D., J. D.
Dean of the Institute of Law; Professor of Law.

FACULTY OF UNIVERSITY

JOHN EVAN RICHARDS, A. B., LL. B.
(Associate Justice of the District Court of Appeal for the First Appellate District of California.)
Presiding Judge of the District Court of Appeal of the University, Institute of Law.

WILLIAM ARTHUR BEASLY, LL. B.
(Judge of the Superior Court of California for the County of Santa Clara.)
Judge of the Superior Court of the University, Institute of Law.

CLARENCE CHARLES COOLIDGE, B. S., A. B., J. D.
Professor of Law.

NICHOLAS BOWDEN, LL. B.
Professor of Law.

JAMES PETER SEX, Ph. D., J. D.
Professor of Law.

OWEN DALE RICHARDSON, A. M., LL. B.
Professor of Law.

CURTIS HOLBROOK LINDLEY, LL. D.
Lecturer in Law.

JOSEPH LAVIALLE DONOVAN, U. S. A. Ret., C. & M. E.
Professor of Civil Engineering.

GEORGE LEONARD SULLIVAN, B. S., M. E.
Professor of Mechanical Engineering.

JULIAN JEREMIAH GRIMES, A. B., A. C. T., London
Professor of Architecture; Instructor in Mathematics.

OTTO RUDOLPH ZAICHECK, M. D. (Vienna)
Professor of Histology.

RODNEY ALEXANDER YOELL,
Professor of Biology.

FACULTY OF UNIVERSITY

BARTHOLOMEW RICHARD SULLIVAN, B. S.,
Instructor in Accountancy, Commercial Law, and Business Practice.

CLINTON EMMETT HURD,
Instructor in Shorthand and Typewriting.

ERIC EMIL PRITSCHOW, A. M.
Professor of French and German.

JOSEPH ROBERT FERNANDEZ,
Professor of Spanish.

DAVID CLEMENT POWER, B. Mus.
Instructor in Music.

SAMUEL JOSEPH MUSTOL, B. Mus.
Instructor in Music; Leader of The University Band and The University Orchestra.

ALBERT JOSEPH NEWLIN, B. S.
Assistant Observer in the Seismological Observatory.

IMMANUEL ALVIN OLIVER,
Instructor in Shop Work.

FREDERICK GERLACH, M. S., M. D.
Visiting Physician and Surgeon.

ANTHONY STANISLAUS PEREIRA, S. J.
Infirmarian.

UNIVERSITY OF SANTA CLARA

LOCATION.

The University is situated in the Mission town of Santa Clara, in Central California, forty-eight miles south of San Francisco and three miles from San Jose. The valley of Santa Clara is famous throughout the world for the rare beauty of its scenery, the salubrity of its climate, and the excellence of its fruits. The climate is mild and equable both in summer and winter, and on that account singularly favorable to persistent study and research as well as to the maximum of agreeable out-of-doors recreation which such work makes necessary. There is one well-defined rainy season, lasting from December to April inclusive, in which about fifteen inches of rain usually fall. Snow is almost unknown in the valley and falls on the surrounding hills hardly oftener than three times a year, melting almost as soon as it appears. Thirty degrees is normally the lowest temperature experienced in winter nights and this rises to about 55 degrees at noon. The average mid-day temperature in summer is about 70 degrees; it ranges between 60 and 80 degrees, and occasionally rises to a higher figure. Even the warmest days are followed by cool nights of which the usual temperature is 55 degrees.

FOUNDATION.

It is in this scene that the University of Santa Clara is set. It is located on the site of the Old Mission of Santa Clara, Santa Clara, California.

On January 12, 1777, two Franciscan Padres, de la Pena and Murguia, planted the Mission Cross on the banks of a little stream, called from that time the Guadalupe, at a spot now forming a part of the Laurel Wood Farm, near the Agnew Asylum. Two years later, a flood destroyed the primitive buildings, both church and monastery, and the Padres in consequence sought a site on higher ground near the present railway station of Santa Clara.

There, on November 9, 1781, they laid the foundations of a large adobe church and mission buildings. Three years later, on May 15, 1784, the new church was dedicated, by the Venerable Padre Serra, then Padre Presidente of all the Missions of California.

This church, however, was so badly shattered by several earthquakes in 1812 and 1818, that the Padres were forced to build anew. This time they chose the site which the University now occupies. There, on August 11, 1822, the same Padre Serra dedicated a still larger church which did service for many years till the violent earthquakes in the years 1865 and 1868 so cracked and weakened it that extensive repairs were necessary. By the year 1885 it had been almost entirely removed, having been gradually replaced by the present wooden edifice, the interior of which is a nearly perfect facsimile of its predecessor, retaining as it does, some of the old ornaments and furniture and the very ceiling of its sanctuary; while the other parts are so

designed as to be a faithful reproduction of the original church.

The Mission of Santa Clara was secularized in 1836 and passed from the hands of the devoted Padres into those of politicians, who, in dealing with the helpless Indians violated as well God's laws of right and justice, as the laws of the Mexican government in whose name they ruled. Santa Clara was soon robbed of her lands, and her children were oppressed or driven away to the forests.

When Rt. Rev. Joseph Sadoc Alemany, O. P., arrived on the scene, as Bishop of the Diocese of San Francisco in 1850, he found one lone Franciscan in charge of the mission, which had been restored by the American government, though in a sadly reduced form, most of the land being occupied by squatters.

Desiring to save the remnants of the mission, and also to start a college to meet the growing need of the times, the Bishop invited the Society of Jesus to Santa Clara. The invitation was accepted, and accordingly on March 19, 1851, the Rev. John Nobili, with a capital of "one hundred and fifty dollars and a brave heart," laid the foundation of the University of Santa Clara and began the work.

Fr. Nobili adapted the old adobe buildings to the requirements of a school, and in a few years numerous students were in attendance. On April 28, 1855, the institution was chartered a University and continued for many years to be known as Santa Clara College.

In 1904, during the presidency of Father Robert E. Kenna, S. J., a large tract of land was bought at Mt.

View, with the intention of transferring the college thither, but, owing to the lack of financial support, nothing was done.

After careful consideration it was decided, in 1910, that this plan would have to be abandoned and that it was much wiser to improve the College in its present location and thus make the most of the equipment it then had. Accordingly, in 1911, two new reinforced concrete buildings, in the mission style, were begun.

As early as 1907, lectures were commenced with a view to preparing students to enter upon the professional courses in law, medicine and engineering. By 1911, the pre-medical course was thoroughly established and the law school was begun. Realizing, therefore, that the college was practically doing the work of a University, the President, Fr. James P. Morrissey, and the Board of Trustees, on April 29, 1912, decided to adopt officially the name of "The University of Santa Clara". Consequently on June 16, 1912, with appropriate ceremonies, in the presence of Most Rev. Patrick W. Riordan, D. D., Archbishop of San Francisco, of many present and former students, and of 30,000 spectators, this decision was formally announced and the two new buildings dedicated.

In the summer of 1912, practical engineers of high standing were engaged to carry on the courses in engineering, and in the next summer a thoroughly equipped laboratory for engineering was prepared. In the same year the amount of work required of law students was increased and almost all classes in Law were thenceforth held at night.

THE PRESENT.

The number of students is steadily increasing, but, owing to the fact that only a limited number of students can be accommodated this growth of Santa Clara is greatly hampered.

Even more pronounced than this material growth has been the improvement wrought in the student body by the judicious selection of applicants for admission and the elimination from the University, of students whose moral influence was not helpful. The principle of the faculty has been to receive and retain no one whose manners are not proper and whose habits are not irreproachable. Today parents realize that education which neglects manners is a mistake and that a university which overlooks or takes little account of morals is a monstrosity.

CONSTITUENT COLLEGES.

The University now possesses the following constituent Colleges:

The College of Philosophy and Letters;

The College of General Science;

The Institute of Law;

The College of Engineering, embracing Architectural, Civil, Electrical and Mechanical Engineering;

The School of Pedagogy;

And the Pre-Medical Course.

FUNDS AND NEW BUILDINGS.

The growth in the number of students has made it imperative in recent years to provide ampler and more substantial accommodations. For this and in

order that Santa Clara may widen its scope as a first class educational institution, funds are necessary. Santa Clara stands in imperative need of an endowment. The work the University has accomplished in the past is an earnest of what she will do when increased facilities are afforded her.

An endowment, however, implies a founder or founders and benefactors. During the past few years many have helped the University and generous donations have been made. The Administration building, 200x43 feet, and the Senior Hall, both in reinforced concrete, are completed, and the Engineering building is shortly to be begun. But before other buildings for which the plans of the University provide, may be added, further benefactors will be needed. Other educational institutions, even those state-aided and richly endowed receive generous assistance in the work and hesitate not to ask it. Santa Clara feels that generous friends are not lacking, though for the want of deeper thought on the matter, few realize the importance of Christian educational work, the immense sacrifice it entails, and the merit there is in co-operating and sharing with Christian educators in their work for God and Country and the welfare of the young men of our generation who are to become the leaders of the generation of tomorrow. The faculty of the University has given its life-services freely and gladly to the work. Those who would share with them in this great enterprise can do so most effectively by rendering material aid and contributing funds for the continuance and development of the work.

FORM OF BEQUEST.

I give and bequeath unto the President and the Board of Trustees of Santa Clara College, a corporation duly incorporated under the laws of the State of California, a sum of.....dollars.

SYSTEM OF EDUCATION.

The Jesuit system of education aims at developing side by side, the moral and intellectual faculties of the student, and sending forth to the world men of sound judgment, of acute and rounded intellect, of upright and manly conscience. And since men are not made better citizens by the mere accumulation of knowledge, without a guiding and controlling force, the principal faculties to be developed are the moral faculties. Moreover, morality is to be taught continuously; it must be the underlying base, the vital force supporting and animating the whole organic structure of education. It must be the atmosphere the student breathes. It must suffuse with its light all that he reads, illumining what is noble and exposing what is base, giving to the true and false their relative light and shade.

STUDIES.

It is one of the decided advantages of the system followed at Santa Clara, that the student may begin his studies in the Preparatory School conducted under the supervision of the University authorities, and then pass on, through the University Course, to graduation under the same direction and influence. This secures, besides the moral influence thus gained, a uniform and homogeneous course of teaching and training. The re-

sult of this system is a continuous and normal development of the mental faculties along well defined lines, and the possession of a clear and coherent system of principles upon the subjects which he has studied.

FIELDS AND BUILDINGS.

The Mission Church.

Built on the site of the old Mission Church of 1822, this building preserves many of the relics, features and decorations of the Franciscan days, though most of the walls have been removed.

The Memorial Chapel.

As a memorial to deceased students this handsome chapel was erected in 1887, during the presidency of Rev. Father Robert E. Kenna, S. J., through the generosity of many alumni and friends of Santa Clara College.

Senior Hall.

This hall, built in 1912 of reinforced concrete, furnishes on the second and third floors, private rooms for the older students. On the first floor are seven large class-roms for College Classes; the Law Library and Study Hall; the Theoretical and Drawing Classes in Engineering. In the basement are a large social hall, Senior Reading Room, the Practice Court of the Institute of Law, and the Palaeontological Museum.

The Theatre.

All dramatic productions at Santa Clara since 1870, including the Passion Play and the Mission Play of Santa Clara, have been presented in this theatre. Its stage is one of the largest for amateur productions in

the West. The lower floor is fitted up as a Dormitory for older students.

The Literary Congress Building.

For a time the meeting place of the House of Phil-historians and the Philalethic Senate used to be in this building. Now it houses the Department of Chemistry, and is used to some extent as a substitute for a Gymnasium.

The Scientific Building.

The First and Second Division Study Halls, the Typewriting Room, the Physical Cabinet and Laboratory, the Mineralogical Museum, and the Laboratory for Wireless Telegraphy are housed in this building.

The Commercial Building.

This building contains the High School class-rooms and study hall, the Commercial School, the Physical Laboratory for the High School, and the Drafting room of the Architectural Department of the College of Engineering.

The Infirmary Building.

This structure, with its several wings comprises the Kitchen, the Refectories, the Infirmary with private rooms and ward, Dormitories for younger students, Clothes-room, and the Students' Co-operative Store, rooms for the individual practice of Music and the Band-room.

The Observatory.

The equatorial telescope, the seismographs and various meteorological instruments, and the study of the Father in charge, are housed in four small buildings.

Through the generosity of Mr. John W. Ryland, a circular building with revolving dome, is being erected to shelter the telescope.

The Faculty Building.

This structure of reinforced concrete built in 1912, to replace the old Fathers' Building, which was destroyed by fire in 1910, contains the offices of the chief executive officers of the University, parlors, the residence of the Fathers and Scholastics who are attached to the University or the Parish of Santa Clara, and the Library of the University.

The Engineering Laboratory.

Forges, machinery for wood-working and pattern-making, etc., used in the courses of the College of Engineering find place in this building.

Athletic Field.

This includes the grounds devoted to intercollegiate contests in baseball and football. It is equipped with a large grand stand for baseball; the football field is now being turfed at considerable expense through the generosity of alumni.

Outer Campus.

Two city blocks in front of the Administration Building and Senior Hall give room for two large baseball diamonds and football fields for the Junior and other minor organizations.

Inner Campus.

This field located between Senior Hall and the Scientific Building contains the track, tennis courts, handball courts, etc.

SESSIONS, HOLIDAYS, HOURS.

The school year consists of two semesters.

The first semester begins September 2, 1914, and ends January 30, 1915.

The second semester begins February 1, 1915 and ends June 9, 1915.

The recess at Thanksgiving begins November 25, and ends November 30, 1914.

The recess at Christmas begins December 21, 1914, and ends January 4, 1915.

The recess at Easter begins March 31, 1915, and ends April 7, 1915.

The weekly holiday is Wednesday.

Lectures and clases begin daily at 8:50 a. m. and close at 3:30 p. m.

In the Institute of Law, class is held every evening at 6:55 and also on Saturday at 1:30 p. m. Every evening, including Wednesday, there are two periods of class in legal subjects, each of which lasts from one to one and one-half hours.

FACULTY COMMITTEES

Examinations—

Sophomore—The Professors of Sophomore and Freshman Courses.

Junior—The Director of Studies, and the Professors of the Junior Courses.

Senior—The President, the Director of Studies, and the Professors of the Senior Courses.

Theses—The Director of Studies and the Professors of Junior and Senior Courses.

Athletics—The Director of Discipline, the Director of Studies and the Faculty Director, assisted by the Officers of the Student Body.

Dramatics and Public Exercises—The President, the Director of Studies, the Director of Discipline, the President of the Senior Dramatic Club.

"The Redwood"—The Director of Studies, the Faculty Director guiding the staff, and the Professors of Philosophy and English.

Post-Graduate Studies—The President, the Director of Studies, and the Profesors of the subjects in which the Post-Graduate work is taken.

Discipline—The Director of Discipline, the Assistant Director of Discipline and the Director of Studies.

Attendance—The Director of Studies, and the Director of Discipline.

Scholarship and Standing—The Director of Studies, and the Deans of the several Colleges.

SCHOLARSHIPS

Every year several deserving young men of high character and aspirations, whose means do not permit their attending the University, appeal to the Faculty for assistance to obtain the education for which their talents and vocation fit them. There is scarcely a university in the United States which is not provided with a fund for this purpose, and a relatively large percentage of successful college men spring from the class of assisted students. It is clearly a noble benefaction to contribute to such a purpose in any case. But this is especially so in the case of those who apply for help to the University of Santa Clara. They are as a rule young men of high standing, who understand the paramount value of an education in a university which aims at the highest intellectual development of the student, while devoting no less attention to the perfect development of his moral character. As a consequence it follows that to assist them in attaining their desire is to aid picked young men whose future is more than ordinarily full of promise, and who are destined to exert a most powerful influence on those among whom their lives will be spent.

It is the intention of the Faculty of the University of Santa Clara to make an earnest effort to supply this pressing need, by establishing free scholarships for resident and non-resident students, so that worthy young men may receive the help they desire. For this purpose an appeal is made to all who appreciate the importance of the matter.

The Scholarships to be founded will be of two classes, perpetual and temporary. By establishing a perpetual scholarship the donor will maintain one student at the University of Santa Clara in perpetuity. A temporary scholarship will maintain one student at the University during the four years of his course. The amount contributed will be invested in reliable securities, the interest of which will support the student. The cost of founding Scholarships is as follows:

Perpetual Scholarship for a resident student—board, lodging, etc., tuition, text-books	$12,500.00
A perpetual Scholarship for a day student—tuition and text-books	$ 3,000.00
A temporary Scholarship for a resident student—board, lodging, tuition, text-books, for four years	$ 2,000.00
A temporary Scholarship for a day student—tuition, text-books, etc., for four years	$ 500.00

It is the desire of the Faculty to name these scholarships after their founders, that thus the recipients of their generosity may know to whom they are indebted for their education, and ever retain grateful remembrance of them.

THE ALICE PHELAN SULLIVAN MEMORIAL SCHOLARSHIP.

This perpetual scholarship for a resident student was founded in 1912 by the gift of $12,500 from "A Friend" in memory of Mrs. Alice Phelan Sullivan of San Francisco.

THE JESSE W. BRYAN MEMORIAL SCHOLARSHIP.

This perpetual scholarship for a resident student was founded in 1913 by the gift of $12,500 by Mrs. Sarah A. Bryan, in memory of her son, Mr. Jesse W. Bryan, a former student of Santa Clara.

GENERAL REGULATIONS

No one will be admitted as a student unless he has a good moral character.

Candidates for admission must present satisfactory recommendations. Those from other educational institutions must be recommended by the institutions whence they came. For scholarship requirements cf. Graduate and Undergraduate Departments.

Students are not received for a shorter period than one semester.

As the Faculty of the University profess the Catholic Religion, the exercises of religious worship are Catholic; but members of any religious denomination are received, provided they be willing, for the sake of order and uniformity, respectfully to conform to the religious observances of the University.

No student will be permited to leave the University on visits of any length, except at the Christmas holidays from the twenty-first of December to the fourth of January, if such be the wish of his parents or guardian. Parents are requested not to call their sons home at other times, except in cases of urgent necessity, as such interruptions, besides tending to undermine or prevent the acquisition of habits of concentration and persevering work, are apt to result in poor scholarship and in the consequent wrecking of the whole career of the student.

A recess at Thanksgiving and Easter may be given at the discretion of the President.

Students who, having left the University for the

summer vacation, Christmas holidays, or other recesses allowed by the President, fail to be present on the day for the re-opening of class, will, by the fact of absence, be excluded from the University, or at the discretion of the Faculty from privileges until the following semester, particularly the privilege of visiting friends and relatives on the Second Wednesday, unless parents or guardians show cause of absence, which the Faculty shall consider wholly sufficient.

The students are not allowed the use of tobacco, except in First Division with written permission from parents or guardians.

Students are not permitted to have books or other publications that have not been approved by the Vice President.

To cultivate the heart, no less than to develop the intellectual and physical faculties of the students, is a duty kept constantly and sacredly in view.

The students' correspondence is subject to the inspection and control of the President.

To hold meetings or to form clubs or societies of any kind without the consent of the President; the habitual use of profane language; gross immorality committed either within or without the precincts of the Institution; the possession or distribution of immoral publications or pictures; intoxication; procuring or introducing intoxicating liquors, directly or indirectly into the University; habitual idleness and violation of the rules of the University; obstinate refusal to submit to a punishment inflicted; absence from the

University at night without leave from the President; avowed principles of infidelity; express contempt or ridicule of religion, are offenses which expose the offenders to dismissal or suspension, as in the judgment of the Faculty shall be deemed necessary.

EXPENSES IN ALL THE DEPARTMENTS OF THE UNIVERSITY

RESIDENT STUDENTS.

Matriculation fee to be paid but once	$ 15.00
Board, Tuition, Lodging, including washing and mending of linen, per semester	200.00
Fee for athletic activities, per semester	2.50

NON-RESIDENT STUDENTS.

Tuition in University Course, per semester	50.00
Tuition in High School Course, per semester	30.00
Fee for athletic activities, per semester	2.50
Dinner, per semester	35.00

ADDITIONAL EXPENSES.

Furnished Room and attendance, per year, double rooms	60.00
Furnished Room and attendance, per year, double rooms used for one person	120.00

A few rooms are reserved at a higher rate.

No room shall be considered engaged unless a deposit of $10.00 has been made for the same. On his actual entrance into the University, this amount will be retained as security against damage to room or furniture.

Law students' deposit for books, per year	35.00
Pre-Medical Laboratory, per semester	25.00
Penalty for late registration	1.00

Laboratory for Physics or Chemistry, students not in Engineering Courses, per semester	12.50
Modern Languages, not in regular course, per year	20.00
Science deposit for breakage	5.00
Typewriting, full course	20.00
For each Degree and Law Certificate	10.00
For Commercial Certificate	5.00
For each extra examination to remove a condition, or for any examination taken out of time	2.00
Freshman Laboratory, Engineering, etc., per semester	12.50
Sophomore Laboratory, Engineering, etc., per semester	20.00
Engineering Laboratory, shop, use of instruments, etc., in Senior and Junior years, per semester	25.00
Above charges apply equally to all students in Engineering.	
Instruction in Music, per month	8.00

ALL CHARGES MUST BE PAID HALF YEARLY IN ADVANCE.

No expenditure for clothing or for incidental expenses of any student and no advances for pocket money will be made by the Institution, unless an equivalent sum has been deposited with the Treasurer of the University.

Books and stationery are furnished at dealers' rates.

Law students are required to make the above noted deposit of $35 for books, at the beginning of each scholastic year, or at the time they are allowed to enter.

Books will then be issued to them and any balance left over will be credited to their account. Where conveniently possible, law books will be furnished second hand.

No rebate will be allowed in favor of those who enter later, nor in the case of any student, for absence at the opening of the semesters in September and February. No rebate is made when during a semester a student is dismissed, or his withdrawal is requested by the Faculty, or where he leaves of his own accord, except where the cause of his departure is serious illness.

Degrees will not be conferred nor certificates issued until the candidate has settled his account with the University.

An itemized bill is sent at the end of each semester.

(1) Semester bills and other accounts are subject to sight draft if not paid within ten days after they have been rendered.

(2) Remittances should be made payable to the order of the University of Santa Clara.

(3) No one may be temporarily or permanently withdrawn from the University without the President being directly notified. In either event money should be sent for the trip, and, in the latter, accounts ought also to be settled.

(4) A limited number of student waiters can be received at reduced rates.

(5) There are no charges for the services of the University physician. Medicines and infirmary supplies procured at the University infirmary will be charged as used by individuals. An additional charge of $1.00

a day is made where a student occupies a room in the infirmary.

A HEALTH REQUIREMENT IS EXACTED.

All students are subject to examination by the University physician.

EVERY APPLICANT

should fill out an application blank and forward it to the President, enclosing a certificate of the studies he has completed with a testimonial as to his character and diligence, signed by the head of the school last attended. Where the applicant has received a degree, or has been otherwise graduated, he should present his diploma or its equivalent, duly signed by the proper authorities of the school that issued it.

The articles which every student coming to reside at the University should bring with him are, more or less; two pairs of sheets, three pillow cases, two counterpanes, three suits of clothes, a sufficient number of shirts, drawers, handkerchiefs, socks, shoes, napkins, towels, combs, brushes, etc., all, without exception, marked with his name distinctly and imperishably before he comes.

Promptness in reaching the University on the day fixed for the opening of classes is necessary. It is essential that Parents and Students understand this clearly from the beginning of their connection with the University, as promptness in returning from vacations and recesses, which is requisite in order to prevent the loss of valuable time and the forming of habits of procrastination and negligence of duty, is strictly insisted on.

DEPARTMENTS OF THE UNIVERSITY

DEPARTMENTS, CURRICULA, COURSES.

The University includes the Graduate and Undergraduate Departments.

GRADUATE DEPARTMENT.

Aim and Scope.—The Graduate Department offers students who have attained to Academic Degrees, studies leading to the higher ones of Master or Doctor as the case may be. The determination of these courses rests with the Committee on Post-graduate Studies. A sufficiently wide option is allotted, much of the instruction being in the form of direction along lines of original research.

Courses may be had in Philosophy, Sociology and Economics, English, Latin, Greek, and Mathematics, as well as in the Pre-Medical course, the Professional Colleges of Law and Engineering.

Graduates who have received the degree of Bachelor of Arts or Bachelor of Science, may receive the degree of Juris Doctor on completing the course of the Institute of Law.

Theses—Before one is admitted to any degree in any Department, or to a certificate in Law, a thesis must be submitted on a subject chosen by the student, with the approbation of the Committee on Theses. It must bear on the matter studied, or at least on cognate matter, and it shall consist of no fewer than 5000 words. The theses should be typewritten on National White

unruled paper, 8½x10¼ inches. The ultimate decision as to whether the effort merits the Degree rests with the Committee on Theses.

UNDERGRADUATE DEPARTMENTS.

These include:

A. THE COLLEGE OF PHILOSOPHY AND LETTERS.

A four years' college course, leading to the degree of Bachelor of Arts.

B. THE COLLEGE OF GENERAL SCIENCE.

A four years' college course, leading to the degree of Bachelor of Science.

C. THE INSTITUTE OF LAW.

A standard three years' course of law, leading to the degree of Juris Doctor or Bachelor of Laws. Open also to Special students. Graduates admitted to practice law without examination, subject to the right of the Chief Justice to order examination.

D. THE COLLEGE OF ENGINEERING.

(a) Architectural Engineering. A four years' course leading to the degree of Bachelor of Science in Architecture.

(b) Civil Engineering. A four years' course leading to the degree of Bachelor of Science in Civil Engineering.

(c) Mechanical Engineering. A four years' course leading to the degree of Bachelor of Science in Mechanical Engineering.

(d) Electrical Engineering. A four years' course leading to the degree of Bachelor of Science in Electrical Engineering.

E. THE SCHOOL OF PEDAGOGY.

A course of studies in Education which aims at preparing graduates of the University for capable service in the field of high school education.

F. THE PRE-MEDICAL COURSE.

A two years' course of studies in Chemistry, Biology, and Anatomy, which is recommended to students contemplating entrance into medical schools.

ENTRANCE REQUIREMENTS.

Applicants for admission to the Freshman Year of the College of Engineering must either (1) have completed the regular Four-Year High School course of the Preparatory School of the University, or (2) have completed a similar course in an accredited High School, or (3) pass an examination based on a four-year course amounting in the aggregate to fifteen units. Of these fifteen units, ten or more are prescribed and required of all applicants; the rest are elective from the list of optional subjects.

CONDITIONS.

In certain cases, at the discretion of the Committee on Entrance Standing, which shall decide on the merits of each particular case, conditions in elective branches to the amount of not more than two units may be allowed. All conditions must, however, be removed by the end of the Freshman year.

As the prescriptions in the classical languages are difficult for secondary schools to meet, two conditions may be permitted in these languages in cases of special merit.

COLLEGE OF PHILOSOPHY AND LETTERS.

Subjects Prescribed.

English	3	units
History	2	units
Latin	4	units
Greek	2	units
Algebra	1½	units
Geometry	1½	units

Electives.

Physics	1	unit
Chemistry	1	unit
Foreign Languages	2	units
History	1	unit
History	2	units
Trigonometry	½	unit

COLLEGE OF GENERAL SCIENCE.

Subjects Prescribed.

English	3	units
History	2	units
Foreign Languages	2	units
Algebra	1½	units
Geometry	1½	units

Electives.

Physics	1	unit
Chemistry	1	unit
Foreign Languages	2	units

English	1 unit
History	2 units
Trigonometry	½ units

COLLEGE OF ENGINEERING.

Subjects Prescribed.

English	3 units
History	2 units
Foreign Languages	2 units
Algebra	1½ units
Geometry	1½ units

Electives.

Physics	1 unit
Chemistry	1 unit
Foreign Languages	2 units
English	1 unit
History	2 units
Trigonometry	½ unit

To count a "unit" a subject must be taught five times a week, in periods of not less than forty-five minutes, for a school year of not less than thirty-six weeks.

INSTITUTE OF LAW.

Entrance Requirements and Conditions of Graduation

Are fully set out on page 147 of this catalogue.

GENERAL PROVISIONS REGARDING SCHOLARSHIP AND STANDING.

Attendance.

No student is eligible to enter any examination, written or oral, nor is he entitled to credit, unless he has been in attendance at 80 per cent of the classes, but students in the Institute of Law must have been in attendance at 90 per cent of the classes. Absence caused by sickness will not excuse a student from the operation of this rule.

Written Examinations

Are held monthly in all subjects and in all departments. They are also held twice a year upon the work seen during the preceding semester.

Oral Examinations

At the end of the scholastic year must be passed by all the following classes of students.

1. Students finishing Sophomore year in the College of Letters or the College of Science must be examined in English, Latin, and Greek (or a Modern Language), ten minutes in each subject.

2. Students who have followed the course in Elementary Law for one semester or more must be examined therein for ten minutes.

3. All students, regular or special, who have followed the courses in Philosophy and Political Economy, or any part thereof, must be examined therein for twenty minutes.

4. All students, regular or special, in the Institute

of Law, the Pre-Medical Courses, the School of Pedagogy, and all other courses open to Juniors and Seniors in the College of Letters or the College of Science, except Philosophy and Political Economy which have been provided for above, must be examined in the subjects pertaining to such schools or courses, for forty minutes.

5. All students in the Commercial Department, as a final test for graduation, must be examined for thirty minutes in all subjects taught in that Department, or in such of those subjects as the examiners may choose.

No student may be orally examined unless he has passed satisfactorily all the written examinations given at the end of each semester on the matter seen therein, or having been conditioned on the first semester examination, has removed the condition; nor unless in addition to the preceding requirement he has received a passing grade on the whole year's work in every subject studied.

The examination must extend to all the work done during both semesters in the subjects indicated; but if the student was present during only one semester, the examination covers the work of that semester only.

The examination is to be conducted privately before a board of the Faculty who may increase the time allotted to any examination if they see fit.

Promotions.

A student to be promoted in any subject must have attained an average of at least 70 per cent on the whole year's work in that subject.

Said average is computed as follows, all work being marked on the basis of 100 for perfect work.

Class-work plus monthly examination divided by two gives monthly mark.

The sum of four monthly marks and four times the semester examination mark, divided by eight gives the semester mark.

The sum of the marks for the first and second semester divided by two gives the mark for the whole year's work.

Where an oral examination is required, the student cannot be promoted or graduated unless he attains therein the passing mark of 70.

Special regulations as to the grades to be maintained by law students, candidates for degrees and certificates, will be found under "Institute of Law, Graduation."

Conditions.

A mark of 60 to 70 indicates a condition.

When Conditions May Be Removed.

Where a student is conditioned in an examination given at the end of the first semester, he will not be re-examined until approximately two months after his failure. Unless this condition is removed upon re-examination, the student will not be admitted to the final examinations at the end of the year.

Where a student is conditioned in a written or oral examination, given at the end of the school year, he will not be re-examined until the beginning of the next school year; provided however, that where a student is conditioned in a written or oral examination given as one of the final tests before graduation, he will not

be re-examined until six months after receiving the condition.

See also "Failures" below, for pre-requisites to re-examination.

Failures.

A mark of less than 60 indicates a failure.

A failure in a subject means that the student must repeat the work in class the next time it is given.

A conditioned student who fails to pass a satisfactory examination at the time set for condition examinations, receives a failure in the subject.

If the condition is received in a Bookkeeping or a Laboratory course, the student must make up the work in which he is deficient before the time of the condition examinations, or receive a failure.

Fee for Condition and Irregular Examinations.

For every examination written or oral, given out of the regular time, or to remove a condition, an extra charge is made of two dollars.

Recommendation to Other Schools.

No student will be recommended for entrance into any other University, College or High School who has not maintained an average of 85 per cent in every subject throughout his course.

Candidacy for Degree or Certificate.

Every person who wishes to become a candidate for a degree or certificate in the work of any school connected with the University, must, not later than one month after his entrance, file with the Committee of Scholarship and Standing a written statement of the

degree or certificate to which he aspires and the work which he proposes to do. He will then be informed whether he may be admitted as a candidate for such degree or certificate and whether the work proposed is satisfactory. Any change of purpose must be similarly announced.

Electing Studies.

All students must inform the Director of Studies in writing as to their choice of subjects, and no one may enter upon a course or drop one already taken up without his advice and consent, upon penalty of receiving no credit in the first case and a condition in the subject dropped, in the second.

Registration Card.

Before registering for instruction in any department, the student must obtain a card signed by the Treasurer of the University, showing that a satisfactory settlement of the student's account has been made. He must then obtain another blank from the Director of Studies, write thereon the subjects elected and approved, and present it, together with the Treasurer's card, to his professors for their signature. It should then be returned to the Director of Studies, to be filed in his office.

WRITTEN WORK.

The following written work is to be required of the students, in all the classes indicated:

All students in the courses of Philosophy and Political Economy must write and deliver to their professor every month an essay of not less than 1500 words, on

a subject selected by him from the matter lately studied.

In all classes of Mathematics, three problems or riders are to be set weekly.

In all classes of English, a composition, essay, or poem, and two written exercises in addition, are to be given in weekly by the students.

In all classes in Modern Languages, there shall be as many written exercises as there are classes.

In classes of Latin and Greek three themes are to be handed in each week. See Latin C. 10, College of Letters.

All of these out-of-class exercises will be corrected by the teacher, either in class or out of it, and returned corrected to the students.

PRIZES.

Prizes are awarded in all classes and in all subjects, to the students who are first and second in merit.

Students whose yearly average is 85 per cent or over are given distinctions.

No student is eligible for an ordinary prize who has not been present for the whole school year.

EXTRAORDINARY PRIZES.

The following extraordinary prizes are open to competition on the dates announced in the University Calendar. The Faculty Committee of Scholarship and Standing reserves the right not to award any of these prizes in the absence of sufficient competition or a meritorious grade of scholarship.

Senior Nobili.

An annual prize of $60.00 founded by Joseph A. Donohoe, Esq., in honor of the First President of Santa Clara, Fr. John Nobili, S. J., to be given to the student who shall be deemed first in morals, obedience and application to study.

Junior Nobili.

An annual prize of $35.00 founded by Michael H. Kelly, Esq., to be given to the student in the High School Department who shall be deemed first in morals, obedience and application.

The Archbishop's Medal.

An annual prize of $50.00, the gift of His Grace William Patrick Riordan, Archbishop of San Francisco, for the student who shall have competed most successfully in an examination in Christian Doctrine.

The Donohoe Prize.

An annual prize of $50.00, to be awarded to the student who shall show the greatest progress in the study of Latin and Greek during the session, has this year been set aside for the best Latin Composition and divided into three purses of $25.00, $15.00 and $10.00, respectively.

The Ryland Medal.

An annual prize of $25.00, the gift of Hon. C. T. Ryland of San Jose, to be given to the student who may be deemed by the University most fit for the prize, has been set aside for the student who shall be judged to have distinguished himself most in the Annual Ryland

Debate. To this sum John W. Ryland, Esq., B. S. '77, LL. B. '12, has added the sum of $25.00, to be divided into a second prize of $15.00 and a third prize of $10.00.

The Barchi Prize.

An annual prize of $25.00 for the best paper on such scientific subject, as shall be determined by the Faculty, is divided into two purses of $15.00 and $10.00 respectively.

The McCann Prize.

An annual purse of $25.00 founded in honor of Daniel B. McCann, B. S. '84, to be given for the best short story.

The Redwood Medal.

An annual prize of $25.00 founded in 1908 by the executive committee of "The Redwood", and given for the best essay on a historical subject.

The Owl Medal.

An annual prize of $25.00 founded by the directors of the former College Magazine, "The Owl", to be given to the winner of the elocution contest in the University.

The Junior Elocution Prize.

An annual prize of $25.00 to be given to the winner of the elocution contest in the High School Department.

The Silver Medals for Conduct and Application to be given to the following students who become most distinguished for good conduct and application to study:

1. The most distinguished **resident University** Student.
2. The most distinguished **non-resident University** student.
3. The most distinguished **resident High School** student.
4. The most distinguished **non-resident High School** student.

Colleges of Philosophy and Letters and General Science

COLLEGES OF PHILOSOPHY AND LETTERS AND GENERAL SCIENCE

SENIOR YEAR		JUNIOR YEAR		SOPHOMORE YEAR		FRESHMAN YEAR	
Subject	Hrs.	Subject	Hrs.	Subject	Hrs.	Subject	Hrs.
Phil. of Religion	2	Phil. of Religion	2	Evidences	2	Evidences	2
Ethics and Theodicy	10	Mental Philosophy	5	English	5	English	5
Economics	2	Elective	14	Mathematics, Anal. Geometry	3	Mathematics, Plane and Spher. Trig.	3
Elective	14	Economics	2	Physics	3	Chemistry	3
		Psychology	4	Physics, Lab.	4	Chemistry, Lab.	4
				History	2	History	2
				Latin	5	Latin	5
				Greek	4	Greek	4

Modern Languages are substituted for the Classics in the College of Science.

COLLEGE OF PHILOSOPHY AND LETTERS.

The College of Philosophy and Letters covers a curriculum of four years and leads to the Degree of Bachelor of Arts. It comprises courses of studies selected with special regard to their cultural value, and which, far from being of merely cultural importance, afford the most solid foundation for many of the learned professions and for those larger comercial pursuits characteristic of the present age, which demand intellects carefully trained and poised by the most efficient educational instruments available. The Degree of Bachelor of Arts is awarded only to those students who in addition to other prescribed studies present a minimum of four years of Greek.

During the first two years of this curriculum the chief studies are the classical languages and literatures, English, Mathematics, Natural Sciences and History. In the last two years courses in philosophy, ethics and economics are prescribed, and elective work, which counts as two years for the Degree of Bachelor of Arts, may be taken in the Institute of Law, in the Pre-medical Department, in the Department of Pedagogy, and other departments of the University.

COLLEGE OF GENERAL SCIENCE.

The Curriculum of the College of General Science extends over four years and leads to the Degree of Bachelor of Science. Students whose preparatory training in the classics was not sufficient to warrant their entrance into the College of Philosophy and Letters are

eligible to this curriculum, in which, with the exception of classical literatures, for which modern languages and literature are substituted, are contained all the strong studies of the curriculum of the College of Philosophy and Letters.

At the beginning of the third or Junior Year in this course students may enter the Institute of Law, the Pre-medical Department, the Department of Pedagogy or elect other studies from the University curricula to the amount of one year's work in credits for the Degree of Bachelor of Science, work in either Department being accepted towards the credits necessary for the degrees of A. B., B. S., LL. B., and J. D.

PHILOSOPHY.

Course 1. Logic.

Ten Hours, One Semester

(a) **Dialectics.** Simple Apprehensions. Terms—their Supposition. The Definitions and the Division. Judgements. Propositions,—Classification according to Quantity and Quality. Opposition, Equivalence, Conversion, Reasoning,—underlying Principles. The Syllogism; its Laws and its Species. Induction. Method. The Circle.

(b) **Critics.** Logical Truth and Falsity. States of the mind as to truth. Certitude; Degree, Elements, Kinds. Skepticism, Universal and Partial. Consciousness. The Senses. Nominalism, Conceptualism, Realism, Ultra-Realism. Testimony. Tradition, history. The New Criticism. Reason and Revelation. The Ultimate Motive of Certitude. Evidence.

Course 2. Basic Ontology.

Ten Hours, One Semester

(a) Basic Ontology. Being. Analogy. Axioms. Unity, Identity, Distinction—Real and Logical. Truth. Goodness, Evil. Act and Potentiality. Essence and Existence. Possibility, Extrinsic, Intrinsic. Sources of the latter. Substance—Complete, Incomplete—Hypostasis, Person. Accident—Absolute, Relative. The Categories of Aristotle.

(b) Ontology and Etiology. The Principle. The Cause. The Condition. The Occasion. Matter—Primordial and Secondary. Form—Substantial, Accidental. Efficiency and Action. Finality. The Order of Intention and the Order of Achievement. The Exemplar. Grades of Perfection. Beauty.

(c) Cosmology. Qualities of Bodies. Quantity—Discrete and Continuous. Mathematical Divisibility. Formal Effect. Impenetrability. Space. Place. Change —Substantial, Accidental. Motion and Time. Laws of Nature. Atomism, Dynamism, Hylomorphism.

(d) Biology. Organic Life Defined. Vegetable Functions. The Vital Principle in the Plant. Its Superiority to Anorganic Forces. Sensation,—External, Internal. Imagination, Memory, Instinct, Sleep. The Rank of the Animal Soul. Origin of Species. Theory of Independent Formations. Monistic Evolution. Darwinism.

(e) Psychology. (a) The Intellect. Genesis of Ideas. Self-consciousness. Judgement and Reasoning. Hypothesis of Innate Ideas. Empiricism. Ontologism. (b) The Will. Freedom. Arguments. Control over Faculties. (c) The Soul. Substantiality, Simplicity, Spir-

ituality, Immortality. The Unity of Each Individual. Union of Body and Soul. Origin of the Human Soul. Traducianism. Creacionism. Pre-existentianism, Unity and Antiquity of the Race.

Course 3. Theodicy and General Ethics.

Ten Hours, One Semester

(a) Existence and Nature of God. Metaphysical, Physical, Moral Proofs. Aseity. Infinity, Immensity. (b) Life of God. Intelligence. The Futuribles. Will —Primary and Secondary Object. Moral and Physical Evil. (c) Action of God in the Universe. Creation, Conservation, Concurrence, Providence. Miracles.

(b) General Ethics. Nature, Object, Necessity of Ethics. Teleology, Beatitude. Human Acts. Voluntary and Involuntary Acts. Morality of Human Acts and its Determinants. Passions. Habits. Moral Obligation and its Origin. Eternal Law. Natural Law. Sanction of Law. False Norms of Morality. Utilitarianism. Hedonism. Altruism.

Course 4. Special Ethics.

Ten Hours, One Semester

Duties, Worship. Internal and External Worship. False Worship. Homicide. Self-defense. Suicide. Dueling. Veracity. Charity. Rights. Private Ownership. Communism. Socialism. Agrarian Socialism. Henry George. Herbert Spencer. Capital and Labor. Domestic Society. Matrimony. Divorce. Celibacy. Parental Authority, Education. Relation of Master and Servant. Civil Society; its Nature and Origin. False Theories of Hobbes, Rousseau, Locke. Forms,

Scope, Aim, Functions of Civil Government. Suffrage. Liberty of Opinion, of the Press, of Worship, of Association. International Law. Church and State.

ECONOMICS.

Course 1. Production and Consumption.

Two Hours, One Semester

Productive Capacities of Earth, of Man, Industrial Organization, Progress, Locality and Dimensions. Theory of Consumption, Particulars. Family Life and Law. Growth and Decay of Nations.

Course 2. Exchange.

Two Hours, One Semester

Trade in General. Market Prices. Non-Market Prices. Differential Gains. International Trade, Money. Coinage and Tokens. Credit and Banking. The Foreign Exchanges. Use and Abuse of Commercial Credit. Uncommercial Credit.

Course 3. Distribution.

Two Hours, One Semester

Profits. Interest. Wages, Rich and Poor. An Apologia for the Rich. Mistaken Theories on Riches. Liberty and Law. Association and Responsibility.

Course 4. Public Finance.

Two Hours, One Semester

Functions and Cost of Government. Public ownership and Management. Principles of Taxation. Different Kinds of Taxes. Public Debts.

Course 5. Economic Science.

Two Hours, One Semester

Scope, method and history of the Science of Economics.

SOCIOLOGY.

Course 1. Socialism and Trade Unions.

Two Hours, One Semester

A lecture course dealing with the history, development and trend of Socialism and Trade Unionism. This course involves copious collateral reading and the verification of inferences by investigation into the aspirations and methods of present day representatives of the movements studied.

Course 2. Capitalism.

Two Hours, One Semester

A course dealing with the history and estimation of accumulated private wealth and following it to its present day forms and characteristics.

Course 3. Condition of the Wage Earners.

Two Hours, One Semester

This course examines into the actual condition of the working classes and implies an investigation into the helpful and hindering influences which affect the workers and the consideration of the efficacy of present day methods for the betterment of the condition of the wage earners.

Course 4. Co-operation. Competition and Combination.

Two Hours, One Semester

A more critical and profound examination into the basic principles of present day economic institutions and of the reforms suggested to remedy their defects.

PHYSICS.

Course 1. Mechanics, Molecular Physics, Sound.

Three Hours, One Semester

General principles of matter. General properties of Bodies. Equilibrium. Gravity. The balance. Laws of falling bodies. Pendulum. Properties peculiar to Solids. Hydrostatics. Capillarity, endosmose, diffusion, absorption. Hydro-dynamics. The property of gases. Barometers. Measurement of the elastic force of gases. Aerodynamics. Production, propagation and reflection of sound. Measurement of the number of vibrations. The physical theory of music.

Course 2. Light, Heat, Electricity.

Three Hours, One Semester

Transmission, velocity, intensity and reflection of light. Mirrors. Single refraction. Lenses. Dispersion and achromatism. Optical instruments. The eye. Sources of light. Phosphorescence. Double refraction. Interference and polarization. Properties of magnetism. Methods of magnetism. Laws of magnetic action. Terrestrial magnetism. Fundamental principles of frictional electricity. Quantitative laws of electric

action. Distribution. Electrostatic induction of influence. Electric machines. Condensation of electricity. Voltaic cell. Its modifications. Magnetic field due to current. Galvanometers. Ohm's law. Conversion of electric energy into heat. Thermo-electricity. Electro-dynamics. Electro-magnets. Magnetization of iron. Telegraphy. Electro-magnetic induction. Passage of electricity through gases. Magneto and dynamo electric machines. Diamagnetism. Connection between electricity and light. Physiological action of the current. Animal electricity.

Course 3. Physical Measurements.

Four Hours, One Semester

The use of scales. The straight and barometer vernier. The spehrometer. Micrometer wire gauge. The Cathetometer. The micrometer and compound microscope. Angular measurements. The circular vernier, the optical lever. Poggendorff's method and the spirit level. Estimation of mass. General theory of the balance. Weighing by vibrations. Exact weights and errors in weighing. Measurement of area and volume. Determination of density. Relative densities. Elasticity, tenacity and capillarity. Determination of atmospheric pressure. Time, gravitation and moments of inertia. Pendulum. Determination of gravity by Kater's and Bessel's method. Determination of the velocity and pitch of sound.

Course 4. Physical Measurements.

Four Hours, One Semester

Elementary electro-statics. Electrification by fric-

tion, conduction and induction. Magnetism. Determination of horizontal force and magnetic moment. Fundamental experiments in Volatic electricity. The galvanoscope and the galvanometer. Determination of E. M. F. Wheatstone's bridge. Calibration of galvanoscope. Measurements of resistance. The high resistance differential astatic galvanometer. Measurement of galvanometer resistance. Thomson's method. Differential method. Use of side meter bridge. Carey Foster's method. Measurement of very low resistances. The method of comparison of potentials, projection of equal potentials and auxiliary conductors. Measurement of high resistances. The direct deflection method. Electrolyte resistance. Electrolytic resistance by alternating currents. The tangent galvanometer. Use of the standard galvanometer and the determination of E. M. F. Application of Joule's law. Use of potential galvanometer. Determination of the magnetic elements. Electro-magnetism and electro-magnetic induction. Action of linear curent on magnet. Biot and Savart's law. Proof of electro-magnetic laws. Magnetic action of a solenoid. Laws of the electro-magnet. Induction experiments. Induction balance of Hughes. Damping. Comparison of resistance by magneto conductor. Use of earth inductor. Study of magnetic distribution. The condenser. Determination of the absolute capacity of a condenser. Electrometers.

MATHEMATICS.

Course 1. .Plane Trigonometry.

Three Hours, One Semester.

A course in Plane Trigonometry with many applications so as to give a thorough review of algebra and geometry. Practical problems.

Course 2. Spherical Trigonometry, Advanced Algebra.

Three Hours, One Semester.

A brief course intended to familiarize the student with Spherical Trigonometry and some of its applications. The last four months of the semester will be devoted to Higher Algebra, special attention being given to graphical methods.

Course 3. Analytic Geometry.

Four Hours, One Semester.

A course covering the general principles and more practical applications of Plane Analytic Geometry.

Course 4.. Analytic Geometry and Calculus.

Three Hours, One Semester.

A brief course of Solid Analytic Geometry and elementary Calculus intended to acquaint the student with the methods of higher mathematics.

Course 5. Differential Calculus.

Three Hours, One Semester.

A course intended for Seniors and covering thoroughly the theoretical parts of the subject.

Course 6. Integral Calculus.

Four Hours, One Semester.

A course similar to course 5 in Integral Calculus.

For other Courses in Mathematics cf. The College of Engineering.

CHEMISTRY.

Course 1. General and Inorganic Chemistry.

Three Hours, One Semester.

Discussion of Fundamental Laws, Mathematics of Chemistry. Ordinary elements studied from the standpoint of the periodic law.

Course 2. Laboratory.

Four Hours, One Semester.

Practical demonstration of laws and theories enunciated in Course 1. This Course accompanies Courses 1 and 2.

Course 3. Analysis A.

Two Hours, One Semester.

Dry methods of analysis; detection of metals, non-metals and acid radicals. Use of blowpipe.

Course 4. General and Inorganic Chemistry.

Two Hours, One Semester.

Ordinary and the rarer elements from the standpoint of the periodic law. Metallurgy, with particular adaption to the needs of Engineering Students.

Course 5. Laboratory.

Two Hours, One Semester.

Practical demonstration of principles discussed in Course 4. Manufacture of Iron, Steel, Cement, Gas, Lubricators, Distillates, Pigments, and Alloys.

Course 6. Analysis B.

Two Hours, One Semester.

Qualitative and quantitative analysis. Gravimetric, volumetric and electrolytic methods. Preparation of normal solutions. Fire Assay methods.

Course 7. Inorganic Chemistry.

Three Hours, One Semester.

Chemical divisibility and combinations. Methods of determining atomic and molecular weights. Fundamental laws of chemistry. Chemical equivalents. Valency. Electro-chemical series. Acid, Basic and Neutral substances. Groups. Mendelejeff's Periodic Law. Equations. Problems. Non-metals and metals.

Course 8. Organic Chemistry.

Three Hours, One Semester.

Constitution, classification, decomposition and synthesis of organic compounds. Homologous Series. Paraffins and derivatives. Hydroxy-acids. Carbohydrates. Kinds of Isomerism. Mixed compounds containing Nitrogen. Unsaturated compounds. Olefins, Acetylenes and principal derivatives. Aromatic compounds. Benzine and derivatives. Phenyl-Methanes

and aniline dyes. Hydrocarbons containing two Benzene residues. Glucosides, Proteins and Alkaloids.

Course 9. Experimental Organic Chemistry.

Four Hours, One Semester.

Detection of carbon, hydrogen, nitrogen, chlorine, sulphur and phosphorus in organic compounds. Practical demonstration of properties, tests, combinations and decompositions of organic compounds. Preparation and study of typical organic substances. Special reference to methods of physiological Chemistry.

This course accompanies Course 8.

Course 10. Experimental Chemistry II.

Four Hours, One Semester.

Gravimetric analysis. Preliminary manipulations. Typical determinations of metals and of acids. Electro-lytic method of analysis. Volumetric analysis. Standard and normal solutions. Indicators. Calibration of vesesls. Methods based upon saturation, oxidation and reduction, precipitatrion. Gas analysis. Estimation of carbon, hydrogen, nitrogen, chlorine, sulphur, phosphorus, and organic compounds. Determination of molecular weights.

ENGLISH.

Course 1. English Versification.

One Hour, First Semester.

Theory. Study of selected short poems, especially with a view to practice in verse making.

Course 2. Masters of Metre.

Two Hours, First Semester.

Tennyson. Swinburne. The principles of metric art and verse-harmony as exemplified in these writers, with an historic treatment of the development of English metres and verse-forms.

Course 3. Early Nineteenth Century Poets.

Two Hours, First Semester.

Wordsworth, Keats, Byron, Lectures and critical interpretations of selected poems.

Course 4. Historic Influence in Nineteenth Century Verse.

Two Hours, First Semester.

A study of the influence of history, political, philosophical, economic, literary and religious, on the poetry of the last hundred years, with copious illustrations from Wordsworth, Byron, Shelly, Tennyson, Browning, Morris, Swinburne, Francis Thompson, and Kipling.

Course 5. California Verse Writers.

Two Hours, First Semester.

A course of selected readings, criticisms, and lectures aiming at an analysis of the determining factors of California poetry and an appreciation of its quality.

Course 6. Verse Writing.

Three Hours, First Semester, One Credit.

Practice in verse composition. Simpler forms. The Sonnet and other restricted forms.

Course 7. The Essay.

One Hour, Third Quarter.

Lectures and recitations. The invention, arrangement, and presentation of material. The different species, historical, philosophical, scientific, critical, etc., masterpieces.

Course 8. English and American Essayists.

Two Hours, Third Quarter.

Lectures and Reports. Nature and growth of the modern literary and critical essay.

Course 9. The Short Story.

Two Hours, Third Quarter.

Nature, development, and technique of the short story, with criticisms of selected models.

Course 10. Nineteenth Century Prose Stylists.

Two Hours, Third Quarter.

A critical study and analysis of the characteristic features of the style of selected authors.

Course 11. The Magazine Article.

Three Hours, Fourth Quarter.

Nature and characteristics, with selected readings and criticisms.

Course 12. Narrative and Exposition.

Four Hours, Second Semester, One Hour Credit.

Practice in the writing of essays, magazine articles, and short stories. Supplementary to courses 7, 8, 9, 10 and 11.

Course 13. Oral Expression and Interpretation.

One Hour, Both Semesters.

Readings and memory recitations, with special regard to emphasis, rhythm, harmony and gesture. Individual training.

Course 14. The Theory of Argumentative Writing.

One Hour, First Semester.

Lectures and recitations. A course based on Aristotle, Cicero, Quintilian, and Kleutgen, and aiming at a rational exposition of the principles of oratorical reasoning and persuasion.

Course 15. Representative Modern Orators.

Two Hours, Third Quarter.

Readings and criticisms. A course supplementing course 14 but more concrete in scope.

Course 16. Sources and Materials in Public Speaking.

Two Hours, Third Quarter.

Lectures and siminary work. Each student is required to gather the material for three speeches on topics assigned by the professor.

Course 17. Extempore Speaking and Brief-Making.

One Hour, Third Quarter.

A course supplementary to courses 15 and 16, and dealing with the methods and the practice of extempore speaking.

Course 18. The Speech for Special Occasions.

Three Hours, Fourth Quarter.

A practical study of the distinguishing characteristics of speeches for special occasions.

Course 19. Oratorical Composition.

Three Hours, Both Semesters, Two Hours Credit.

Weekly exercises in speech-writing with special reference to course 14.

Course 20. Drama.

Three Hours, Fourth Quarter.

The principles of dramatical composition. Several dramas are read and analysed, special attention being given to Shakespeare.

Course 21. Special Composition.

One Hour, One Semester.

A course consisting chiefly in written work and required of all upper classmen whose writing in English is such as to make additional facilities for practice in English Composition desirable.

N. B.—Courses 3, 4 and 5 are given alternately with Course 2. Courses 9 and 10 are given alternately with Course 8. Course 20 is given alternately with Course 18.

LATIN.

Course 1. Virgil—The Aeneid.

Four Hours, One Semester.

After reading books VII—XII, the poem will be studied as a whole, special attention being given to the sources, to the epic technique and literary art of Virgil and to the tracing of his influence in the literature of the world.

Course 2. Rapid Reading 1.

One Hour, One Semester.

A course intended to give to the student a broad knowledge of Roman life and literature and to facilitate the study of Latin sources.

Course 3. Latin Composition 1.

Two Hours, One Semester.

Composition in narration and description based chiefly on the text of the Aeneid and implying a discrimination of the vocabulary, and syntax of prose and verse. Students will write three compositions weekly.

Course 4. The Latin Historians.

Four Hours, One Semester.

Copious readings in Sallust, Curtius, Pliny and Livy, with critical consideration of the historical works of these writers and collateral reading directed to reach an appreciation of their place in Latin literature.

Course 5. Rapid Reading 2.

One Hour, One Semester.

The complete works of Tacitus will be read in this course.

Course 6. Latin Composition 2.

Two Hours, One Semester.

A continuation of Course 3, but based on the Latin historians.

Course 7. Cicero.

Three Hours, One Semester.

The orations studied as models of oratorical art, rapid reading, analysis, discussion, criticism.

Course 8. Horace.

Three Hours, One Semester.

The Odes Books I—IV, will be read and carefully studied. Students will memorize selected odes and portions of odes. Such phases of Roman life as are suggested will be the subject of collateral reading under the direction of the professor.

Course 9. Latin Composition.

Two Hours, One Semester.

Written work on subjects assigned by the professor will be required three times a week. Students will be expected to show facility and elegance of diction in their written work.

Course 10. Thesis.

Five Hours, One Semester.

At the beginning of the second Semester of the Sophomore year, the professor after consulting with the students shall assign to each a thesis implying copious reading in Latin. The Thesis shall be typewritten and contain at least 6000 words.

GREEK.

Note: Greek is required only for those students who intend to proceed to the degree of Bachelor of Arts.

Course 1. Simple Greek Prose.

Four Hours, One Semester.

Selections are taken from the Anabasis, Chrysostom, Plato, Gregory and Nazianzen. This course is open to those who have completed the course of Elementary Greek.

Course 2. Simple Greek Poetry.

Four Hours, One Semester.

Elegies of Gregory Nazianzen, Idylls of Theocritus, selected portions of the Odyssey of Homer. In this course, Greek life and customs are studied in detail, special attention being given to the various dialects.

Course 3. Simple Greek Composition.

One Hour, Both Semesters.

Systematic training in the writing of simple Greek, with copious imitations taken from authors studied in Courses 1 and 2.

Course 4. Greek Literature, I.

Four Hours, One Semester.

Reading of selected portions of the Odyssey and Iliad, Sophocles, Pindar, and Euripides. In this course special attention is given to the Greek epic as a whole and Greek tragedy and lyric poetry are studied in detail.

Course 5. Greek Literature, II.

Four Hours, One Semester.

Representative types of the Grecian orators, Chrysostom, Basil, Demosthenes, will be carefully read and studied as a whole.

Course 6. Rapid Reading.

One Hour, Both Semesters.

Sight reading of the easier portions of the Greek historians, and written compositions in imitation.

HISTORY.

Course 1. European History, 1305-1563.

Two Hours, One Semester.

Exile of the Papacy and the Great Western Schism. The Hundred Years War. The Wars of the Roses. Consolidation of the European Monarchies. The Inquisition. The Renaissance. General character of the period. The Age of Charles V. The Protestant Revolution and the Catholic Revival.

Course 2. European History, 1563-1714.

Two Hours, One Semester.

The Hugenot War in France. Philip II., Mary Stuart and Elizabeth. The Thirty Years War. The Puritan Revolution. The Age of Louis XIV.

Course 3. European History, 1714-1800.

Two Hours, One Semester.

The Hanoverian Succession. The making of Russia. Mary Teresa and Fredreick II. Wars of the Suppres-

sion. The colonies in North America. The Seven Years War. The Division of Poland. Progress of the Political and Social Revolution of the Eighteenth Century. The American War of Independence. The French Revolution.

Course 4. European and American History, 1800.

Two Hours, One Semester.

The Era of Napoleon I. Catholic Emancipation in Great Britain. The Revolution of the Barricades and of the Cabinet. The Civil War in the United States and its causes. Our own times.

Lectures on the moral, political, economic, and social aspects of these periods of history, are given twice every week. The subjects enumerated are studied in detail.

PHILOSOPHY OF RELIGION, EVIDENCES, MORALS.

Course 1. The Essentials of Christian Doctrine 1.

Two Hours, One Semester.

Various Creeds. The Apostle's Creed. Each Article of the Creed is studied in particular, attention being given to any subject bearing directly on these articles, as Sin, The Powers of the Church, Infallibility, etc.

Course 2. The Essentials of Christian Doctrine 2.

Two Hours, One Semester.

The Law of God. What is commanded and forbidden by the Decalogue is studied in detail. The Pre-

cepts of the Church, Grace, Prayer, and each of the Seven Sacraments together with collateral subjects.

Course 3. Truth of the Catholic Religion.

Two Hours, One Semester.

(a) **Christianity a revealed religion.** What Religion is. What Revelation is. Kinds of revelations. What revelation necessary to know truths above human ken. Man's attitude toward Revelation. Primitive, Patriarchal, Mosaic Revelation. The Divine origin of Pre-Christian Revelation. The Christian Revelation; its origin, evidences of divinity of its origin.

(b) **The Church. The Dispenser of the Christian Religion.** Institution of the Church. End of the Church. Constitution of the Church. Marks of the Church. The teaching office of the Church. Sources of the Church's teaching. The rule of Faith.

Course 4. Christian Dogma.

Two Hours, One Semester.

(a) **God the Author and Restorer of our Salvation.** The existence, nature, and attributes of God. The Divine Trinity. God the Creator of the universe. Various grades of creation. The spiritual and material world. Man. Relation of different orders of creation to one another. God the Redeemer of the fallen man. Decree and plan of redemption. The Redeemer one person and two natures. The work of redemption.

(b) **The Plan of Redemption as realized in Individuals.** Grace, actual, habitual or sanctifying. The Sacraments as a means of Grace. The Sacraments are studied in general—their matter and form,—their efficacy

and the dispositions requisite to receive them validly and with fruit. Then each Sacrament is studied in detail. The Church as a means of salvation. The four last things.

Course 5. Christian Morals.

Two Hours, One Semester.

(a) Christian Morals in General.—Law as the objective norm of human actions. Conscience as the subjective norm of human actions. The condition of morality. Moral good and moral evil.

(b) Christian Morals in Particular. The Christian's duties toward God,—Faith, Hope, Charity. Religion. Direct and indirect acts of worship. The Church as the controller of religious worship. Duties towards ourselves and our neighbor,—general and particular.

(c) Works of supererogation or Christian perfection.

MODERN LANGUAGES.

French.

Course 1. Elementary French I.

Four Hours, One Semester.

In this course the student is carefully drilled in elementary grammar up to the irregular verbs, attention also being given to acquiring a vocabulary of the more common words.

Course 2. Elementary French II.

Four Hours, One Semester.

A continuation of the preceding course. Special attention is given to the more important irregular

verbs, the memorizing of words, and translation of French into English and vice versa.

Course 3. Intermediate French I.

Four Hours, One Semester.

A thorough review of grammar and syntax. The object of this course is to acquaint the student with the scientific vocabulary and enable him to read the more simple scientific French.

Course 4. Intermediate French II.

Four Hours, One Semester.

This course continues the work begun in Course 3. Regular exercises are given in written work and copious reading is made from the standard scientific works in order to fit the student for professional reading.

Course 5. Advanced French I.

Four Hours, One Semester.

A thorough review is made of Courses 1 and 2, by means of conversational exercises, sight reading and written exercises. Selections are read from the more noted French writers.

Course 6. Advanced French II.

Four Hours, One Semester.

A continuation of Course 5, with conversational exercises and copious readings from the French authors.

German.

Course 1. Elementary German I.

Four Hours, One Semester.

Elements of German Grammar. Drill in pronunciation. Vocabulary.

Course 2. Elementary German II.

Four Hours, One Semester.

A continuation of Course 1. Syntax, Oral and written exercises. Reading from the more simple German prose.

Course 3. Intermediate German I.

Four Hours, One Semester.

Review of syntax. Translation. Oral and written exercises. Reading from the German scientific works to acquire a technical vocabulary.

Course 4. Intermediate German II.

Four Hours, One Semester.

Reading and written and oral exercises in technical German. This course aims at preparing the student to undertake the reading of the more difficult scientific works.

Course 5. Advanced German I.

Four Hours, One Semester.

A study of the German prose authors with copious selected reading.

Course 6. Advanced German II.

Three Hours, One Semester.

A more extensive course in German literature, especially in German poetry.

Spanish.

Course 1. Elementary Spanish I.

Four Hours, One Semester.

Elements of Spanish grammar. Drill in pronunciation, Vocabulary.

Course 2. Elementary II.

Four Hours, One Semester.

A continuation of Course 1. Syntax, oral and written exercises. Reading from the simpler Spanish prose.

Course 3. Intermediate Spanish I.

Four Hours, One Semester.

Review of grammar and syntax. Translation. Oral and written exercises. Reading from somewhat difficult Spanish prose.

Course 4. Intermediate Spanish II.

Four Hours, One Semester.

Reading, written and oral exercises.

Course 5. Advanced Spanish I.

Four Hours, One Semester.

A study of Spanish prose authors with copious reading.

Course 6. Advanced Spanish II.

Four Hours, One Semester.

Spanish Poetry.

College of Engineering

COLLEGE OF ENGINEERING

The foundation of the College of Engineering in the University of Santa Clara was the result of repeated and urgent requests that opportunities should be given young men, ambitious to follow the Engineering profession, to pursue and complete the studies leading thereto in an environment and atmosphere conducive as well to deep persevering study as to cultural and moral development.

To meet this demand, the Faculty of the University has added sound and thorough courses in Architectural, Civil, Electrical and Mechanical Engineering. Each of these departments is in the hands of experienced and practical engineers who devote their whole time and attention to the success of their work. As is traditional at Santa Clara, students in Engineering are given individual care, assistance, advice and encouragement. The work exacted is of the highest type; neverthless, owing to this individual care and to the judicious admission of students as well as the prompt elimination from the various departments of students found to be inadequately prepared in fundamental studies or in seriousness of purpose, there is very little likelihood and no excuse for failure on the part of the student.

The demand for engineers is today greater than ever before. Owing to the vast extent of our State and of the neighboring States, as well as of Alaska on the North and the Great Mexican and Central American Republics on the South, with which California is so in-

timately connected, and owing moreover to the fact that these countries are as yet comparatively undeveloped and that California, on account of her unexcelled climate and almost unlimited natural sources of power, is bound to take her place among the foremost manufacturing states of the Union, it is evident that this demand for first class engineers will go on increasing for many decades to come. Logically it is California that should supply a very great proportion of this demand. The young men of our State have, therefore, a most powerful incentive to enter the engineering profession in its various branches, in which, granted a broad and thorough preparation, they are assured of success.

That this preparation can be given by mere trade schools is no longer contended. The engineer today must be more than a machinist, electrician or surveyor. He can no longer be a self-made man in the old sense. His mind must possess the acumen and culture which only a broad college training and college association can give, and his acquaintance with and love of mathematics and science should be the foundation on which his knowledge of their technical applications is based.

This is the ideal which Santa Clara cherishes for the engineers who shall receive their education from her.

COURSES.

Four year Courses are offered leading to the degrees of Bachelor of Science in Architectural Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering and Bachelor of Science in Mechanical Engineering. These courses aim, first, to give the student a thorough knowledge of the

sciences on which all Engineering is based, second, to develop his ability to acquire accurate information, third, to develop his judgment by practical work so that he may be able to use his knowledge and information to the best advantage.

ARCHITECTURAL ENGINEERING.

The Course in Architectural Engineering gives facility in the application of the fundamental principles of beauty and strength to buildings. Architectural forms and principles and their application in Architectural design are taken up, together with the strength of materials and the design of trusses, columns and reinforced concrete, the whole enabling the student to produce correct, beautiful and economical works of Architecture.

CIVIL ENGINEERING.

Civil Engineering covers the field of structural work (steel, concrete and stone buildings and bridges), municipal engineering (roads, pavements and sewers), water power development, irrigation and railroad construction. These are all based on the fundamental sciences of Mathematics, Physics and Chemistry, and as much practice as possible is given to facilitate the application of these sciences to professional work.

ELECTRICAL ENGINEERING.

Electrical Engineering has to do with the design and construction of electrical machinery and the various applications of electricity to the arts. Electrical and Mechanical Engineering are so closely interrelated that

the courses of the first three years are the same, and it is only the Senior courses, such as Telephony and pure Electrical design, that are differentiated from the Mechanical Engineering courses.

MECHANICAL ENGINEERING.

Mechanical Engineering may be divided into three closely related lines, Design, Manufacturing and Power Generation. The courses in Design begin with mechanical drawing and continue with a study of mechanisms, strength of materials, stresses in, adaptability, cost, and commercial worth of machines. Manufacturing has to do with the organization of commercial enterprises, systems of works management, efficiency systems, cost of materials and power and layout of machinery in a factory for maximum output. The subject of Power Generation is covered by courses on steam and gas engines, turbines, boilers, water motors and electric generators, together with the proper operation of all classes of machinery and the application of power thereto.

ENTRANCE REQUIREMENTS.

Applicants for admission to the Freshman Year of the College of Engineering must either (1) have completed the regular Four-Year High School course of the Preparatory School of the University, or (2) have completed a similar course in an accredited High School, or (3) pass an examination based on a four-year course amounting in the aggregate to fifteen units. Of these fifteen units, ten or more are prescribed and required of all applicants; the rest are elective from the list of optional subjects.

SUBJECTS PRESCRIBED.

English	3 units
History	2 units
Foreign Languages	2 units
Algebra	1½ units
Geometry	1½ units
Physics	1 unit

ELECTIVES.

Chemistry	1 unit
Foreign Languages	2 units
English	1 unit
History	2 units
Trigonometry	½ unit

To count a "unit" a subject must be taught five times a week, in periods of not less than forty-five minutes, for a school year of not less than thirty-six weeks.

CONDITIONS.

In certain cases, at the discretion of the Committee on Entrance Standing, which shall decide on the merits of each particular case, conditions in elective branches to the amount of not more than two units may be allowed. All conditions must, however, be removed by the end of the Freshman year.

Every applicant should fill out an application blank and forward same to the President, enclosing a certificate of the studies he has completed with a testimonial as to his character and diligence, signed by the Principal of the school last attended.

The articles which each student who comes to

reside at the University should bring with him are, more or less: two pairs of sheets, three pillow cases, two counterpanes, three suits of clothes, a sufficient number of shirts, drawers, handkerchiefs, socks, shoes, napkins, towels, combs, brushes, etc., all, without exception, marked distinctly and imperishably with his name.

Promptness in reaching the University on the day fixed for the opening of classes is necessary. It is essential that Parents and Students understand this clearly from the beginning of their connection with the University, as promptness in returning from vacations and recesses, which is requisite in order to prevent the loss of valuable time and the forming of habits of procrastination and negligence of duty, is strictly insisted on.

REQUIREMENTS FOR GRADUATION.

CREDITS.

In all of the groups of the College of Engineering, 176 credits are required for graduation. A credit is given for each one-hour recitation, or lecture, (requiring one hour preparation) per week, carried satisfactorily for one semester, or for two hours per week, spent in a laboratory, drawing room or shop, for one semester.

REQUIRED SUBJECTS.

The subjects required for graduation are given under appropriate headings on the following pages.

GRADES.

Semester grades are expressed on a basis of 100 for perfect work.

70 is required for passing.

60-70 indicates a condition.

Below 60 indicates a failure.

A student making 70 or more in any course is given the credits for that course. If he makes from 60 to 70 he must pass a satisfactory examination at the time set for condition examinations or receive a failure in the subject.

If the condition is received in a laboratory course, the student must make up the work in which he is deficient before the time of the condition examinations, or receive a failure.

A failure in a subject means that the student must repeat the subject in class the next time it is given.

Students, who, on account of ill-health or other cause, are not able to carry 22 credits a semester, will be allowed to carry a lighter course, which will enable them to graduate in five years.

REQUIRED COURSES.

FRESHMAN YEAR OF ALL FOUR YEAR COURSES.

First Semester.

	Hours Attendance		
	Rec.	Lab.	Credits.
College Algebra, Eng. Math. (1)	3		3
Trigonometry, Eng. Math. (2)	2		2
Chemistry, Chem. (1)	3	4	5
Mechanical Drawing, M. E. (1)		6	3
English, Eng. (1)	3		3
French, German or Spanish, M. Lang. (1), (3) or (5)	4		4

	Hours Attendance Rec.	Lab.	Credits.
Review of Engineering Industries, M. E. (9)	2		2

Second Semester.

Analytic Geometry, Eng. Math. (3)	5		5
Chemistry, Chem. (2)	3	4	5
Descriptive Geometry, M. E. (2)	1	4	3
English, Eng. (2)	3		3
French, German or Spanish, M. Lang. (2), (4) or (6)	4		4
Review of Engineering Industries, M. E. (9a)	2		2

ARCHITECTURAL ENGINEERING.

SOPHOMORE YEAR.

First Semester.

	Hours Attendance Rec.	Lab.	Credits.
Calculus, Eng. Math. (4)	5		5
Technical Mechanics, C. E. (7)	3		3
Physics, Physics (1)	3	4	5
English, Eng. (3)	3		3
Construction, Arch. (10)	2		2
Descriptive Geometry, Arch. (1)		4	2
Design, Arch. (2)		4	2

Second Semester.

Calculus, Eng. Math. (5)	5		5
Technical Mechanics, C. E. (8)	3		3
Physics, Phy. (2)	3	4	5

	Hours Attendance Rec.	Lab.	Credits.
English, Eng. (4)	3		3
Construction, Arch. (11)	2		2
Design, Arch. (3)		4	2
Free Hand Drawing, Arch. (7)		4	2

JUNIOR YEAR.

First Semester.

Mechanics of Materials, C. E. (9) and (11)	3	4	5
Masonry, C. E. (20)	4		4
Graphic Statics., C. E. (18)	3		3
Structural Design, C. E. (14)		4	2
Architectural Design, Arch. (4)		8	4
Philosophy, Phil. (1)	4		4

Second Semester.

Graphic Statics., C. E. (19)	3		3
Structural Design, C. E. (15)		4	2
Pictorial Drawing, Arch. (24)	1	4	3
Architectural Design, Arch. (5)		8	4
Philosophy, Phil. (2)	4		4
Elective			4
Fireproofing, Arch. (13)	2		2

SENIOR YEAR.

First Semester.

Trusses, C. E. (22)	4		4
Concrete, C. E. (27)	2	2	3
History of Architecture, Arch. (8)	2		2
Heating and Ventilation, M. E. (25)	2		2
Sanitation, Arch. (12)	2		2

	Hours Attendance Rec.	Lab.	Credits.
Interior Decoration, Arch. (14)	2		2
Design, Arch. (6)		8	4
Philosophy, Phil. (3)	3		3

Second Semester.

History of Architecture, Arch. (9)	2		2
Business Law, Law (1)	1		1
Political Economy, Pol. Econ. (1)	2		2
Contracts and Specifications, C. E. (31)	2		2
Thesis, Arch. Thesis			6
Philosophy, Phil. (4)	3		3
Elective			7

CIVIL ENGINEERING.

SOPHOMORE YEAR.

First Semester.

	Hours Attendance Rec.	Lab.	Credits.
Calculus, Eng. Math. (4)	5		5
Technical Mechanics, C. E. (7)	3		3
Physics, Phy. (1)	3	4	5
Geology, Geol. (1)	2		2
Surveying, C. E. (1)	1	2	2
Drawing, C. E. (12)		4	2
English, Eng. (3)	3		3

Second Semester.

Calculus, Eng. Math. (5)	5		5
Technical Mechanics, C. E. (8)	3		3
Physics, Phy. (2)	3	4	5

	Hours Attendance Rec.	Lab.	Credits.
Mineralogy, Geol. (2)	2		2
Surveying, C. E. (2)	1	4	3
English, Eng. (3)	3		3
Drawing, C. E. (13)		2	1

JUNIOR YEAR.

First Semester.

Mechanics of Materials, C. E. (9)	3		3
Masonry, C. E. (20)	4		4
Graphics, C. E. (19)	3		3
Differential Equations, Eng. Math. (6)	2		2
Field Engineering, C. E. (3)	1	4	3
Structural Design, C. E. (14)		4	2
Materials Testing Laboratory C. E. (10)		2	1
Philosophy, Phil. (1)	4		4

Second Semester.

Hydraulics, C. E. (21)	3	2	4
Electricity, E. E. (14)	2	2	3
Graphies, C. E. (19)	3		3
Method of Least Squares, Eng. Math. (7)	2		2
Field Engineering, C. E. (4)	2	4	4
Structural Design, C. E. (15)		4	2
Philosophy, Phil. (2)	4		4

SENIOR YEAR.

First Semester.

Roofs, Bridges and Other Trusses, C. E. (22)	4		4
Roads and Pavements, C. E. (24)	2		2

	Hours Attendance Rec.	Lab.	Credits.
Sewers and Sanitation, C. E. (25)	2		2
Geodesy and Astronomy, C. E. (26)		2	1
Concrete and Reinforced Concrete, C. E. (27)	2	2	3
Engineering in Field, C. E. (5)		6	3
Design, C. E. (16)		4	2
Tunneling, C. E. (28)	2		2
Philosophy, Phil. (3)	3		3

Second Semester.

Roofs, Bridges and Other Trusses, C. E. (23)	4		4
Political Economy, Pol. Econ. (1)	2		2
Irrigation, C. E. (29)	2		2
Railway Construction, C. E. (30)	2		2
Estimates and Specifications, C. E. (31)	2		2
Engineering in Field, C. E. (6)		4	2
Thesis, C. E. (17)			3
Business Law, Law (1)	2		2
Philosophy, Phil. (4)	3		3

Note. A month of practical field-work under actual conditions at the University farm at Loyola, in the foot-hills of Santa Clara County, is required during the vacation at the close of the Junior and of the Senior year.

The credits of the Junior and Senior years are not complete without these courses, unless the student has had the equivalent in actual practice in civil engineering.

ELECTRICAL AND MECHANICAL ENGINEERING.

SOPHOMORE YEAR.

First Semester.

	Hours Attendance Rec.	Lab.	Credits.
Calculus, Eng. Math. (4)	5		5
Technical Mechanics, C. E. (7)	3		3
Physics, Physics (1)	3	4	5
Kinematics, M. E. (3)	2		2
English, Eng. (3)	3		3
M. E. Laboratory, M. E. (15)		4	2
Shopwork, M. E. (10)		4	2

Second Semester.

Calculus, Eng. Math. (5)	5		5
Technical Mechanics, C. E. (8)	3		3
Physics, Physics (2)	3	4	5
Drawing, M. E. (4)	1	4	3
English, Eng. (4)	3		3
Shopwork, M. E. (11)		6	3

JUNIOR YEAR.

First Semester.

Mechanics of Materials, C. E. (9)	3		3
Machine Design, M. E. (5)		4	2
Boilers, M. E. (18)	2		2
Electrical Measurements, Physics (3)	2		2
Electric Machinery, E. E. (1)	2		2
Differential Equations, Eng. Math. (6)	2		2
E. E. Laboratory, E. E. (9)		2	1
Materials Testing Laboratory, C. E. (11)		4	2
Shopwork, M. E. (12)		4	2
Philosophy, Phil. (1)	4		4

Second Semester.

	Hours Attendance Rec.	Lab.	Credits.
Hydraulics, C. E. (21)	3	2	4
A. C. Machinery, E. E. (2)	3		3
Steam and Gas Machinery, M. E. (19)	3		3
Machine Design, M. E. (6)		4	2
E. E. Laboratory, E. E. (10)		2	1
M. E. Laboratory, M. E. (16)		4	2
Shopwork, M. E. (13)		4	2
Surveying, C. E. (32)		2	1
Philosophy, Phil. (2)	4		4

ELECTRICAL ENGINEERING.

SENIOR YEAR.

First Semester.

	Hours Attendance Rec.	Lab.	Credits.
Thermodynamics, M. E. (20)	4		4
Internal Combustion Engines and Automobiles, M. E. (21)	3		3
Electrical Design, E. E. (6)		6	3
Alternating Currents, E. E. (3)	2	4	4
Telephony, E. E. (4)	2		2
E. E. Laboratory, E. E. (11)		6	3
Philosophy, Phil. (3)	3		3

Second Semester.

Power Plant Design, E. E. (7)	1	4	3
Electric Railways, E. E. (5)	2		2
Electrical Design, E. E. (8)		4	2
E. E. Laboratory, E. E. (12)		4	2

	Hours Attendance Rec.	Lab.	Credits.
Contracts and Specifications, C. E. (31)	2		2
Political Economy, Pol. Econ. (1)	2		2
Business Law, Law (1)	1		1
Technical Literature, E. E. (13)	1		1
Thesis, E. E. Thesis			4
Philosophy, Phil. (4)	3		3

MECHANICAL ENGINEERING.

SENIOR YEAR.

First Semester.

	Hours Attendance Rec.	Lab.	Credits.
Thermodynamics, M. E. (20)	4		4
Internal Combustion Engines and Automobiles, M. E. (21)	3		3
Industrial Engineering, M. E. (23)	3		3
Machine Design, M. E. (7)		4	2
Graphics, C. E. (18)	3		3
M. E. Laboratory, M. E. (17)		4	2
Shopwork, M. E. (14)		4	2
Philosophy, Phil. (3)	3		3

Second Semester.

Technical Literature, M. E. (27)	1		1
Power Plant Design, M. E. (8)	1	2	2
Industrial Engineering, M. E. (24)	3		3
Hydraulic Motors, M. E. (22)	2		2
Business Law, Law (1)	1		1
Contracts and Specifications, C. E. (31)	2		2

	Hours Attendance Rec.	Lab.	Credits.
Political Economy, Pol. Econ. (1)	2		2
Thesis, M. E. Thesis			4
Philosophy, Phil. (4)	3		3
Elective			2

OUTLINE OF COURSES.

ARCHITECTURE.

(1) Descriptive Geometry.

Two Credits. **Four Hours, Drawing. First Semester.**

Problems in point, line, plane, curved surfaces and double curved surfaces of revolution. Intersection of planes and solids. Development of solids. Plane surface solids. Intersection of solids. Perspective. Shades and shadows. Isometric projections. Applications, Prerequisite, M. E. (2).

(2) Design.

Two Credits. **Four Hours, Drawing. First Semester.**

The student is taught to draw with neatness and precision the various Orders. Free scope is given him to bring into play his designing ability. This course is a preparation for general architectural composition and aims to bring out and direct along proper channels whatever ability in designing the student may have. At first simple problems are given but as the student's ability increases he is given more difficult problems.

(3) Design.

Two Credits. **Four Hours, Drawing.**
Second Semester.

Continuation of (3). Prerequisite, Arch. (3).

(4) Design.

Six Credits. **Eight Hours, Drawing.**
First Semester.

Continuation of (4). Prerequisite Arch. (4).

(5) Design.

Six Credits. **Eight Hours, Drawing.**
Second Semester.

Continuation of (5). Prerequisite, Arch. (5).

(6) Design.

Four Credits. **Eight Hours, Drawing.**
First Semester.

Continuation of (6). Prerequisite Arch. (6).

(7) Freehand Drawing.

Two Credits. **Four Hours, Drawing.**
Second Semester.

Drawings are made from casts and afterwards from life. In all drawings precision and neatness in free-hand work is demanded.

(8) History of Architecture.

Two Credits. **Two Hours.**
First Semester.

Fully illustrated lectures and recitations are given on the Architectural history of different periods. The outlines of general history are studied in conjunction with the architecture of the times in order to enable

the student to appreciate the relation of the people and their architecture. A careful study is made of the various examples of the great architectural styles of these times and also of painting and sculpture.

(9) History of Architecture.

Two Credits. **Two Hours.**
Second Semester.

Continuation of (16). Prerequisite Arch. (16).

(10) Construction.

Two Credits. **Two Hours.**
First Semester.

A course intended to give the student the fundamental notions. Foundations are studied and their adaptability to various soils. Manufacture of lime and cement; bricks and their manufacture; stone quarrying and dressing.

(11) Construction.

Two Credits. **Two Hours.**
Second Semester.

After the course in general construction, constructions in frame of wood, stone and brick are carefully studied.

(12) Sanitation.

Two Credits. **Two Hours.**
First Semester.

The draining and sewage of buildings, traps and systems of trapping, plumbing, fixtures, sewage removal and disposal, improved methods of house drainage and sanitary plumbing. Tests.

(13) Fireproofing.

Two Credits. **Two Hours.**
Second Semester.

A study of the different varieties of fire-proofing material and the methods of fire-proof building.

(14) Interior Decoration.

Two Credits. **Two Hours.**
First Semester.

Students are taught the designing of fire-places, stairways, halls, ceilings, wainscoting and the like. Also such ornamental designs for interior or exterior work that will bring into practice what he has learned of the various styles of architecture and their combinations. Plans are made of these in various scales.

CHEMISTRY.

(1) General and Inorganic Chemistry.

Three Hours Lecture, Four Hours, Laboratory.
Five Credits. **First Semester.**

Discussion of Fundamental Laws, Mathematics of Chemistry. Ordinary elements studied from the standpoint of the Periodic Law. Practical demonstration of Laws and Theories.

(2) General and Inorganic Chemistry.

Three Hours Lecture, Four Hours, Laboratory.
Five Credits. **Second Semester.**

Ordinary and rarer elements from the standpoint of the Periodic Law. Metallurgy, with particular adaptation to the needs of Engineering students. Practical

demonstration of principles discussed. Manufacture of Iron, Steel, Cement, Gas, Lubricants, Distillates, Pigments and Alloys. Prerequisite Chem. (1).

CIVIL ENGINEERING.

(1) Surveying.

One Hour Lecture, Two Hours, Laboratory.

Two Credits. **First Semester.**

Theory, construction, use and adjustments of tape, compass, level and transit. Land and city surveying. Plotting, field work and computation of areas. Division of land. Simple leveling. Complete maps. Practical field work covering all matter taught in class work. The object is to thoroughly familiarize the student with the instruments and with field conditions. Field notes. Field maps. Topographical sketching without instruments. Prerequisite Eng., Math. (2).

(2) Surveying.

One Hour Lecture, Four Hours, Laboratory.

Three Credits. **Second Semester.**

Continuation of (1). Prerequisite C. E. (1).

(3) Field Engineering.

One Hour Lecture, Four Hours, Laboratory.

Three Credits. **First Semester.**

Leveling, contour lines, hachures, cross-section work. Use of plane table. Maps of work. Stadia. Transit stadia. City, mine, hydrographic and topographic surveying. Engineering office work. Plotting profiles and cross-sections. Calculation of areas.

Computation of volumes of earth work and masonry. Draughting field notes. Excavation methods in different materials. Estimate of cost. Overhaul. Application to canals, trenches, embankments, dredging, etc. Practical surveying in the field under all the heads in the scope of the work in class. Notes. Calculations. Conditions made as nearly those of a corps in the field as possible, each student being required to fill every position in turn.

(4) Field Engineering.

Two Hours Lecture, Two Hours, Laboratory.
Four Credits. Second Semester.

Continuation of (3). Prerequisite C. E. (3).

(5) Engineering in Field.

Three Credits. Six Hours, Laboratory.
First Semester.

Reconnaissance. Location, preliminary survey and grade stakes for highways, canals and railways. Plots and calculations from notes. Theory of railway curves; simple, compound and taper curves. Locating sidetracks, switches, yards. Cross-sectioning. Triangulation. The work is made as nearly practical as possible and covers the theories and principles taught in class work. Prerequisite C. E. (4).

(6) Engineering in Field.

Two Credits. Four Hours, Laboratory.
Second Semester.

Continuation of (5). Prerequisite C. E. (5).

(7) Technical Mechanics.

Three Credits. **Three Hours.**
First Semester.

General theories and principles concerning matter, inertia, space and time, motion, velocity and acceleration. Momentum. Force. Measures. Comparison and representation of force. Statics: Composition and resolution of concurring forces. Conditions of equilibrium. Composition and resolution of forces acting on a rigid body. Center of gravity. Friction. Virtual velocities. Machines. Funicular polygon. Attractions. Rectilinear and curvilinear motion. Kinetics: laws of motion. Motion under the action of a variable force; and in a resisting medium. Central forces. Constrained motion. Impact. Work and energy. Moments of inertia. Rotary motion. Motion of a system of rigid bodies in space.

Effort is made throughout the course to direct the attention of the student to practical application of mathematical deductions. Prerequisites Eng. Math. (3) and must be taking Physics (1).

(8) Technical Mechanics.

Three Credits. **Three Hours.**
Second Semester.

Continuation of (7). Prerequisite C. E. (7).

(9) Mechanics of Materials.

Three Credits. **Three Hours.**
First Semester.

Resistance and elasticity of materials. Pipes, cylinders and riveted joints. Simple and cantilever beams. Restrained and continuous beams. Columns, shafts

and girders and designing same. Torsion in shafts. Combined stresses. Strength and resilience of materials. Tension and compression. Flexure of beams. Shear and torsion. Apparent and true stresses. Plates, spheres and columns. Analytical and graphical methods used in the solution of problems. Prerequisites Eng. Math. (5) and C. E. (8).

(10) Materials Testing Laboratory.

One Credit. **Two Hours, Laboratory.**
First Semester.

Tests of iron, steel, wood and concrete in tension, compression, shear, bending and torsion. Rattler tests on brick, and standard tests on road materials.

Prerequisite—must be taking C. E. (9).

(11) Materials Testing Laboratory.

Two Credits. **Four Hours, Laboratory.**
First Semester.

Same as C. E. (10) only more complete. Especially for students in Architectural Engineering, Electrical Engineering and Mechanical Engineering. Prerequisite—must be taking C. E. (9).

(12) Drawing.

Two Credits. **Four Hours, Drawing.**
First Semester.

Shading by lines and colors. Topographical drawing and lettering. Conventional signs, etc. Maps of work done in field. Completed maps in pencil, pen and colors. Blue prints. Tracing structural details. Prerequisite M. E. (1).

(13) Drawing.

One Credit. **Two Hours, Drawing. Second Semester.**

Continuation of (12). Prerequisite C. E. (12).

(14) Structural Design.

Two Credits. **Four Hours, Drawing. First Semester.**

Mechanical drawing. Design and working drawing of machinery. Design and drawing of dams in earth, stone, wood, concrete and reinforced concrete. Piers, retaining walls and abutments in different matrials. Design and drawings of concrete and reinforced concrete arches, culverts and bridges. Trestles and viaducts. Simple bridges. Problems under certain conditions are given students from which the design is to be evolved. Drawings given in detail the structure of the design are required.

Prerequisite—must be taking C. E. (10).

(15) Structural Design.

Two Credits. **Four Hours, Drawing. Second Semester.**

Continuation of (14). Prerequisite C. E. (14).

(16) Design.

Two Credits. **Four Hours, Drawing. First Semester.**

Analysis, design, estimate and drawings for a concrete or reinforced concrete dam, retaining wall, culvert or abutment. Same for a reinforced concrete bridge, either of solid arch, rib arch, girder or slab construction. Analysis, design and drawings for a

trussed bent or tower in wood or steel. Analysis, design and drawings for a steel truss highway or railway bridge. In connection with this course, the student will be kept in touch with the latest methods and details of construction.

Prerequisite C. E. (15).

(17) Thesis.

Three Credits. **Six Hours.**
Second Semester.

Original investigation of some Engineering problem.

(18) Graphics.

Three Credits. **Three Hours.**
First Semester.

Principles and methods. Application to roof trusses under dead, snow and wind loads. Complete stresses for triangular and crescent trusses. Unsymmetrical loads and trusses. Bridge trusses. Stresses due to dead, snow, wind, initial tension and live loads. Bowstring trusses. Stress loads. Locomotive wheel loads. Plate girders. Shears. Moments. Trusses with broken chords. Miscellaneous trusses. Elastic deformation of trusses. Application to other engineering structures.

(19) Graphics.

Three Credits. **Three Hours.**
Second Semester.

Continuation of (18). Prerequisite C. E. (18).

(20) Masonry.

Four Credits. **Four Hours.**
First Semester.

Study of materials, stone, brick, terra-cotta, limes, cements, sand, gravel and broken stone. Tests for each, especial attention being paid to limes and cements. Proportions and use of lime and cement mortars. Plain concrete; materials, proportions, forms for, making and placing, water-proofing, strength, weight and cost. Reinforced: beams, columns and slabs; reinforcement of each. Details of construction, including forms, placing reinforcement and concrete, removal of forms, expansion and contraction. Separately moulded members. Concrete building blocks and artificial stone. Stone cutting. Stone Masonry. Classification of stone masonry. General rules for laying. Concrete rubble. Cyclopean concrete. Strength. Brick Masonry. Strength. Construction. Waterproofing. Ordinary foundations. Bed of foundation. Designing footings. Preparing bed under different conditions. Pile foundations. Wood, concrete, reinforced concrete and steel piles. Pile driving. Bearing power. Arrangement of foundation. Foundation under water. Coffer-dam, crib and open-caisson process. Dredging through wells. Pneumatic process as used in buildings, rivers and subways. Freezing process. Masonry dams. Stability of gravity dams. Outlines of the design. Concrete and reinforced concrete dams. Liquid pressures. Causes of failure. Construction details of retaining walls. Theory of stability. Bridge abutments and piers. Culverts. Voussoir Arch. Stability of arches.

Theory of arches and methods of failure. Elastic arch. Plain concrete fixed-end arches. Reinforced concrete hingless arch. Hinged arch. Laboratory work in tests. Lectures giving further data, especially in reference to reinforced concrete and steel-concrete construction and reservoir dams.

(21) Hydraulics.

Three Hours Lecture, Two Hours, Laboratory.
Four Credits. **Second Semester.**

Fundamental data. Hydrostatics. Theoretical hydraulics. Instruments and observations, especially meters and pressure gauges. Flow through orifices. Flow over weirs. Flow through tubes and pipes. Flow in conduits. Flow in rivers. Water supply and water power. Dynamic pressure of water. Water wheels. Overshot, breast, undershot, vertical impulse, horizontal impulse and downward flow impulse wheels. Special forms of wheels. Turbines. Classification. Theory and design of turbines. Downward-flow and impulse turbines. Special devices. Naval hydro-mechanics. Pumps and pumping. Force and centrifugal pumps. Pumping engines. Other kinds of pumps. Pumping through pipes, and through hose. Hydraulic motors. Hydraulic-electric analogies. Stress is laid upon the effect of hydraulic laws upon engineering construction in or under water, especially in problems involving the impounding of water, or oil.

(22) Roof, Bridge and General Trusses.

Four Credits. **Four Hours.**
First Semester.

Analysis and deduction of stresses in members of

roof trusses under different loads. Different types of loads. Final stresses in bridge trusses. Types of highway and railway bridges under dead loads. Live American bridge trusses. Bridge bracing, members and floors. Deflection and least work. Cantilever trusses and cranes. Swing bridges. Hinged trusses. Viaducts. Principles of economic design. Details and design of pin truss bridge. Highway bridges. Railroad riveted bridges.

(23) Roof, Bridge and General Trusses.

Four Credits. **Four Hours.**
Second Semester.

Continuation of (22). Prerequisite C. E. (22).

(24) Roads and Pavements.

Two Credits. **Two Hours.**
First Semester.

Different types of highways. Economic location of highways. Traction resistance. Gradients. Foundations. Preparing foundations. Drainage. Standard cross-sections. Natural, broken stone and other artificial roads. Materials and their adaptability to classes of traffic. Road coverings. Asphalts. Asphaltines and patented road coverings. Oils. Oiled roads. Dust prevention. Maintenance and repairs. Pavements. Paving materials. City streets. Width and cross-section, crown, gutters, curbs, footwalks and crossings. Street intersection and grades. Standard city streets and street railway construction. Repairs. Lectures on improvement and changes in highway construction.

(25) Sewers and Sanitation.

Two Credits. **Two Hours.**
First Semester.

Principles of design. Types. Systems and general use. Standard sewer construction in different forms and materials. Standard and power systems. Sanitary problems involved. Methods of disposition of sewage. Garbage removal and disposition. Cost estimates. Design. Lectures on problems involved.

(26) Geodesy and Astronomy.

One Credit. **Two Hours, Laboratory.**
First Semester.

Class, field and observatory work. Methods of field work to obtain accurate results. Construction, use and correction of errors in instruments. Observatory determination of latitude, longitude, azimuth and time. Field work in determining parallels and meridians. Latitude and azimuth. Transit, altazimuth and sextant and their uses. Solar transit. Triangulations and adjustments. Compass variations. Especial attention directed to use and correction of engineering instruments and their adaptability to astronomical uses.

(27) Concrete and Reinforced Concrete.

Two Hours Lecture, Two Hours, Laboratory.
Three Credits. **First Semester.**

Lecture course supplemented by practical problems. Economic use and properties of concrete, reinforced concrete and steel concrete. Beams and theories of flexure. Columns. Retaining walls, drains, tanks, conduits and chimneys. Tests and designs of arches.

Materials and methods of construction in foundations, buildings, bridges and conduit work. Facing and finishing. Forms. Falsework. Reinforcement; apportioning in girders, beams, columns and slabs. Systems of reinforcement. Placing reinforcement. Waterproofing. The object is to make the student familiar with the details of this modern construction.

(28) Tunneling.

Two Credits. **Two Hours.**
First Semester.

Classification of tunnels. Locating tunnels. Economic location. Different methods employed in tunnels under various soil conditions. Excavating. Removal of excavations. Blasting. Powders. Drills and machinery used. Economic distribution of forces. Heading and bench. Linings in wood, brick, concrete and reinforced concrete. Drainage. Ventilation. Rapid transit system. City subway work and methods.

(29) Irrigation.

Two Credits. **Two Hours.**
Second Semester.

Irrigation in general. Value, cost and returns. Drainage areas. Estimation of rainfall and discharge from drainage areas. Water units and duty. Streams, flow and discharge. Measuring devices. Canals and ditches; construction, alignment, slope and cross-section. Distribution. Application of water in irrigation. Storage work. Water supply and losses. Geological conditions affecting reservoir sites. Earth and masonry dams. Details of headworks, diversion, weirs,

waste ways, sluices and regulators. Pumping machinery. Maintenance. Water rights. Irrigation laws.

(30) Railway Construction.

Two Credits. **Two Hours.**
Second Semester.

Much of the course is also adapted to the construction of canals, highways, levees, etc. Reconnaissance. Location. Alignment, grade and distances. Parties. Staking out work. Grading. Organization of grading parties. Methods of grading. Machines, etc. Output of men, animals and machines. Volumes. Cut and fill. Overhaul. Finishing. Revetments. Drainage areas and waterways. Culverts, size and character. Tracklaying. Tracklaying machines. Surfacing. Ballast. Single and double track roads. Side tracks, switches, crossings and yards. Round houses. Shortening lines. Operating expenses. Maintenance. Genera land extra gangs. Camp hygiene. Right of way. This course is largely lecture work, using standard text-books and writings for reference.

(31) Estimates and Specifications.

Two Credits. **Two Hours.**
Second Semester.

Principally a lecture course, but supplemented by practical problems for which estimates and specifications must be submitted. Position of engineer in construction. Duties. Estimates. Corrections. Latitude allowed. Contracts. General kinds. Special. Specifications. Definiteness. Lectures on law of contracts.

(32) Surveying.

One Credit. **Two Hours, Laboratory. Second Semester.**

Use and adjustment of tape, level and transit. For Electrical and Mechanical Engineers.

Announcement.

Beginning with the summer of 1915 the University Summer School of Field Work in Civil Engineering will be established in camp at Loyola, in the foothills of the Santa Cruz Mountains. This camp is so situated as to offer the student exceptionally ideal areas for field work in plain, foothill and mountain. The field work will be conducted by experienced field engineers, who will, in addition to the full technical course, give thorough instruction in practical camping, camp methods and camp hygiene. The course will be four weeks in length and will be obligatory upon both Junior and Senior Classes in Civil Engineering; each class being under separate instructors and doing individual work.

The course will embrace complete topographical surveys with different instruments, leveling, contouring, railway reconnaissance, preliminary and location survey, cross-sectioning, railway curves, highway surveys and location, maps and profiles, earthwork computation, estimates, watershed computation, irrigation problems and canal surveys, survey and estimate for dams, determination of latitude and longitude, triangulation, base line, geodetic survey of large extent of country, etc.

A full outline of each course and corresponding in-

structors, date of opening, expenses, etc., will be published in the spring of 1915.

ELECTRICAL ENGINEERING.

(1) Electrical Machinery.

Two Credits. **Two Hours.**
First Semester.

Magnetic field. Magneto-motive force. Hysteresis. Elementary dynamo. The magnetic circuit. Armature core. Commutator. Brush shifting. Sparking at brushes and remedies. Different types of generators. Methods of transmitting, distributing and controlling direct current. Direct current series and parallel systems. Feeders and mains. High tension D. C. systems.

(2) Alternating Current Machinery.

Three Credits. **Three Hours.**
Second Semester.

Self and mutual inductance. Capacity. Impedance. Phase angle and power factor. Series of repulsion types. Synchronous motors. Induction motors, single and polyphase. Methods of starting. Speed control. Electric drive for cranes, elevators, presses, pumps, fans, mill-work, etc. Prerequisites Physics (3) and E. E. (1).

(3) Alternating Currents.

Two Hours Lecture, Four Hours, Drawing.
Four Credits. **First Semester.**

Electric power systems. Translating, controlling

and transmitting equipment. Constant potential and constant current transformers. Efficiency, regulation and protection. Polyphase systems of generation. Two phase and three phase and conversion from one system to another. Calculation of alternating current transmission lines. Regulation of voltage. Power factor of systems. Switch-boards. Apparatus used on switch-boards. Location. Types. Pole lines. Cable and conduit systems. Prerequisites E. E. (2).

(4) Telephony.

Two Credits. **Two Hours.**
First Semester.

The magneto-telephone. The microphone. Carbon transmitters. Induction coils. Call methods. Series and parallel circuits. Subscribers equipment. Line disturbances. Common battery systems. Exchange equipment. Party lines. Automatic systems. Combined telegraphy and telephony. Wireless telegraphy. Generation of electrical waves. Transmitting and receiving apparatus. Prerequisites Physics (2) and E. E. (1).

(5) Electric Railways.

Two Credits. **Two Hours.**
Second Semester.

Train resistance due to tracks and bearing surfaces, curves, grades and air. Acceleration and braking. Speed-time curves. Motors for railway work. Controllers. Distribution systems. Track construction. Bonding and electrolysis. Trucks, wheels and car bodies. Conduit, storage battery and third rail sys-

tems. Electric locomotives. Multiple unit control. Testing railway equipment. Financial considerations.

(6) Design of Direct Current Machinery.

Three Credits. **Six Hours, Drawing.**
First Semester.

Electrical and mechanical theory applied to the design of D. C. machinery. Switches, heaters, controllers, etc. Complete calculations and working drawings for a dynamo or motor, to fulfill given specifications. Prerequisite E. E. (1).

(7) Power Plant Design.

One Hour Lecture, Four Hours, Drawing.
Three Credits. **Second Semester.**

Design of a complete plant to furnish light for a city of a given size. Consideration of the elements: illumination, charges, operating expenses, income, organization and administration, reports, specifications, contracts and statistics. Prerequisites E. E. (3) and (6).

(8) Electrical Design.

Two Credits. **Four Hours, Drawing.**
Second Semester.

Design of alternators, transformers, induction motors and other alternating current apparatus. Thorough investigation and complete design of some unit assigned.

(9) Electrical Engineering Laboratory.

One Credit. **Two Hours, Laboratory.**
First Semester.

Determination of the resistance of electric circuits.

Relation between speed, field strength and voltage. Operation of shunt series and compound wound generators. Distribution of potential around commutator. Heat runs to determine load capacity. Stray power. Starting boxes. Counter electro-motive force. Shunt, series, compound and differentially wound motors. Operation of shunt and compound wound generators in parallel. Distribution of load. Constant potential and constant current generators. Control of series circuits. Regulation of arc lamps. Prerequisites—must be taking E. E. (1).

(10) Electrical Engineering Laboratory.

One Credit. **Two Hours, Laboratory.**
Second Semester.

Calibration of ammeters and voltmeters. Calibrations and adjustment of A. C. and D. C. watt-hour meters. Determination of resistances. Measurement of inductance and capacity. Permeability of samples of iron and steel. Determination of hysteresis. Storage batteries. Testing. Candle-power of lamps from standard candle. Cable testing. Insulation resistance. Practice in operation of A. C. motors, generators and other apparatus. Prerequisite E. E. (9).

(11) Electrical Engineering Laboratory.

Three Credits. **Six Hours, Laboratory.**
First Semester.

Alternating current circuits. Inductance, capacity, impedance, phase, relation, true and apparent watts and power factor. Alternators. Magnetization curves.

Losses and synchronous impedance. Synchronous motors. Methods of Synchronizing. Methods of starting rotary converters. Compounding. Calculation of efficiency. Alternators in parallel. Transformers. Regulation. Heating and efficiency. Use as induction regulators and phase changers. Wave shapes by instantaneous contact and by the oscillograph. Resonance. Methods of starting induction motors. Efficiency by brake tests. Operation of induction generator. Reports of complete tests on plants.

(12) Electrical Engineering Laboratory.

Two Credits. **Four Hours, Laboratory.**
Second Semester.

Continuation of (11). Prerequisite E. E. (11).

(13) Technical Literature.

One Credit. **One Hour.**
Second Semester.

Assigned readings and reports from current technical literature.

(14) Electricity.

Two Hours Lecture, Two Hours, Laboratory.
Three Credits. **Second Semester.**

A short course similar to E. E. (1) and E. E. (9) for Civil Engineering Students.

ENGINEERING MATHEMATICS.

(1) Algebra.

Three Credits. **Three Hours.**
First Semester.

Complete Algebra to include quadratic equations, then more particularly: ratio and proportion, progressions, imaginary and complex numbers, indeterminate equations, binomial theorem, variables and limits, inequalities, interpretation of results, logarithms, permutations and combinations, indetermined coefficients, determinants and graphic algebra.

(2) Trigonometry.

Two Credits. **Two Hours.**
First Semester.

Development of general formulae. Functions and their relations. Logarithms and their uses. Properties of triangles. Application of principles to practical problems in right and oblique triangles. Navigation in plane trigonometrical problems. Spherical trigonometry. Application to problems in astronomy and spherical mensuration.

(3) Analytic Geometry.

Five Credits. **Five Hours.**
Second Semester.

Loci. Lines. Circle. Different systems of coordinates. Conic sections. Supplementary propositions. Loci of sceond order. Plane curves of higher order. Solid analytical geometry, especially of surfaces of revolution. General equations. Prerequisites Eng. Math. (1) and (2).

(4) Calculus.

Five Credits. **Five Hours.**
First Semester.

Fundamental formulae and principles for differential and integral calculus. Maxima and minima. Curvature. Surfaces. Volumes. Indeterminate forms. Envelopes. Series. Expansion. Forms of integration. Practical application. Prerequisite Eng. Math. (3).

(5) Calculus.

Five Credits. **Five Hours.**
Second Semester.

Continuation of (4). Prerequisite Eng. Math. (4).

(6) Differential Equations.

Two Credits. **Five Hours.**
Second Semester.

Analysis and deductions of formulae and equations used in physics, mechanics and engineering problems. Applications of formulae and equations given in engineering handbooks to problems. Practical problems and lectures. Prerequisite Eng. Math. (5).

(7) Method of Least Squares.

Two Credits. **Five Hours.**
Second Semester.

Study the principles and methods. Applications to solution of physical, astronomical, engineering and other problems. The student will be made familiar with this higher and more accurate method of solution of problems in his profession, especially triangulations.

ENGLISH.

(1) Composition and Rhetoric.

Three Credits. **Three Hours.**
First Semester.

Lectures and recitations. The invention, arrangement, and presentation of material. The different species, historical, philosophical, scientific, critical, etc., masterpieces.

(2) Composition and Rhetoric.

Three Credits. **Three Hours.**
Second Semester.

Continuation of (1). Prerequisite Eng. (1).

(3) Rhetoric and Literature.

Three Credits. **Three Hours.**
First Semester.

A course in English Rhetoric and Literature. Students who show any deficiency in English are required to take moreover the course in Special Composition. One hour a week is devoted to the study of Engineering Literature.

(4) Rhetoric and Literature.

Three Credits. **Three Hours.**
Second Semester.

Continuation of (3). Prerequisite Eng. (3).

GEOLOGY.

(1) Geology.

Two Credits. **Two Hours.**
First Semester.

Brief Course in Mineralogy with access to a large and historical Geology. Particular attention is paid

to structural Geology and the influences of Instructive and Engineering conditions. The student is made familiar with different stones by illustrating each recitation with specimens of the particular rocks treated, as well as their adaptability in construction, method of occurrence, etc.

(2) Mineralogy.

Two Credits. **Two Hours.**

Second Semester.

Brief Credits in Mineralogy with access to a large collection of specimens. Determination of unlabeled specimens. Chrystallography. Blowpipe analysis. Includes a short course in Metallurgy. Iron ores and production of iron and steel. Percentage and effects of sulphur, silicon, manganese and carbon in iron and steel. Coals, Coke, Carbons and ash. Prerequisite Geology (1).

LAW.

(1) Business Law.

One Credit. **One Hour.**

Second Semester.

A brief course in Contracts, Sales, Negotiable Instruments, Real Estate, Partnership, Corporations and such other subjects as the professor may deem necessary or advisable.

MECHANICAL ENGINEERING.

(1) Mechanical Drawing.

Three Credits. **Six Hours, Drawing.**
First Semester.

Freehand lettering. Use of instruments. Plane problems. Freehand sketching. Orthographic, isometric and cabinet projections. Tracing and blue printing.

(2) Descriptive Geometry.

Three Credits. **One Hour Lecture, Four Hours, Drawing.**
Second Semester.

Orthographic projection of points, lines, planes, warped surfaces, etc., in the four angles of projection. Intersections. Tangents to curves and surfaces. Developments. Practical problems in stereotomy, surveying, architecture, belting layouts, etc. Prerequisites M. E. (1).

(3) Kinematics.

Two Credits. **Two Hours.**
First Semester.

Motion, velocity and acceleration of machine parts. Rolling cylinders and cones. Lobed wheels. Belts. Levers, cams. Linkwork. Gearing. Parallel and straight line motion. Intermittant linkwork. Aggregate combinations. Prerequisite M. E. (1).

(4) Machine Drawing.

One Hour Lecture, Four Hours, Drawing.
Three Credits. **Second Semester**

Language of Mechanical Drawing. Conventional

method of representing bolts, screws and other standards. Piping. Design and detailing simple parts to take tension, compression and shear. Study of different methods of drawing and dimensioning found on commercial working drawings. Accuracy, completeness and speed are required. Prerequisite M. E. (3).

(5) Machine Design.

Two Credits. **Four Hours, Drawing.**
First Semester.

Selection of materials for machine parts. Proper working stresses for different materials under dead, repeated and reversed loads. Determination of nature and distribution of stresses in each element of a machine. Friction. Design of such elements as crank shafts, machine frames, connecting rods, etc., when subject to tension, compression, shear, torsion, bending or any combination of these. Figuring weight and cost of manufacture. The kinematic layout of a machine for functional operation. The evolution of a design from preliminary sketch to complete working and assembly drawings, involving a study of strength, adaptability, symmetry, ease of operation, depreciation and cost of manufacture. In all this work the note-book is as important as the drawings.

Prerequisite M. E. (4).

(6) Machine Design.

Three Credits. **Six Hours, Drawing.**
Second Semester.

Continuation of (5). Prerequisite M. E. (5).

(7) Machine Design.

Two Credits. **Four Hours, Drawing.**
First Semester.

Continuation of (6). Prerequisite M. E. (6).

(8) Power Plant Design.

Three Credits. **Two Hours.**
Second Semester.

Sites. Comparison of high-speed engines. Corliss engines, steam turbines and gas engines. Cost and adaptability of different types of steam boilers. Condensers. Economizers. Superheaters. Pumps. Stokers. Piping. Complete layout of a plant with specifications and advertisement for bids.

(9) Review of Engineering Industries.

Two Credits. **Two Hours.**
First Semester.

Lectures and assigned reading on Engineering studies and work. This course is designed to teach the student how to study and to enable him to make a rational choice of a course of study.

(9a) Review of Engineering Industries.

Two Credits. **Two Hours.**
Second Semester.

Continuation of (9).

(10) Shopwork.

Two Credits. **Four Hours, Laboratory.**
First Semester.

Use and care of saws, planes, squares, etc. Layout

of simple work from blue prints. Lathe tools and exercises in turning.

(11) Shopwork.

Three Credits. **Six Hours, Laboratory.**
Second Semester.

Patternmaking and foundry work. Use of shrink rule. Construction of typical solid, split and piece patterns and core boxes. Layouts from working drawings. Bench moulding. Dry sand, green sand and loam moulds. Swept work. Core making. Shop visits. Prerequisite M. E. (10).

(12) Shopwork.

Two Credits. **Four Hours, Laboratory.**
First Semester.

Management of forge fire. Shaping. Drawing. Upsetting. Swaging. Welding. Tempering. Die forging. Working different grades of iron and steel.

(13) Shopwork.

Two Credits. **Four Hours, Laboratory.**
Second Semester.

Cold-chisel, file and scraper. Work on the lathe, planer, drill, shaper, milling machine and grinder. Assembling, erecting and rigging.

(14) Shopwork.

Two Credits. **Four Hours, Laboratory.**
First Semester.

Continuation of (13). Prerequisite M. E. (13).

(15) Mechanical Engineering Laboratory.

Two Credits. **Four Hours, Laboratory.**
First Semester.

Method of investigation. Classification of errors. Accuracy of numerical calculations. Autographic diagrams. Callibration of pressure gauges, thermometers, pyrometers, indicator springs, tachometers, planimeters, weirs, nozzles, orifices, pitot tubes, Venturi meters and dynamometers. Testing of lubricants. Density, viscosity, gumming, fire-test and cold test. Measurement of power by the prony brake, Alden brake, traction dynamometers and transmission dynamometers. Belt testing. Measurement of flow of liquids and gases by means of meters, nozzles, pitot tubes, etc. Moisture in steam by barrel, Hoadley, Barrus, throttling, separating and chemical calorimeters. Heating value of coals determined by the bomb calorimeter. Heating value of gas by Junker's calorimeter. Flue gas analysis with Orsat's apparatus. Complete tests of steam engines, boilers, gas engines, injectors, pumps and entire plants. Standard reports.

(16) Mechanical Engineering Laboratory.

Two Credits. **Four Hours, Laboratory.**
Second Semester.

Continuation of (15). Prerequisite (15).

(17) Mechanical Engineering Laboratory.

Two Credits. **Four Hours, Laboratory.**
First Semester.

Continuation of (16). Prerequisite M. E. (16).

(18) Boilers.

Two Credits. **Two Hours.**
First Semester.

Heat; conduction, convection and radiation. Heat of evaporation. Combustion. Smoke. Quantity of air required. Methods of firing. Classification of coals. Efficiency of combustion. Boiler horse-power. Types of boilers. Furnaces. Stokers. Draft. Boiler Scale. Water purification. Explosions. Testing. Care of Boilers. Prerequisite Physics (1).

(19) Steam and Gas Machinery.

Three Credits. **Three Hours.**
Second Semester.

Properties of steam. Slide-valve. Indicator. Simple and compound engines. High speed, Corliss and marine engines. Turbines. Steam pumps. Locomotives. Valve gears. Governors. Flywheels. Balancing. Steam engine performance. Operation of two and four cycle gas and oil Engines. Indicator analysis. Prerequisite M. E. (18).

(20) Thermodynamics.

Four Credits. **Four Hours.**
First Semester.

Mechanical theory of heat. First and second laws of thermo-dynamics. Perfect gases. Saturated vapors. Superheated vapors. Hot air engine. Internal combustion engine cycles. Influence of engine cylinder walls. Friction of engines. Refrigerating machines. Injectors. Steam turbines. Prerequisite M. E. (19).

(21) Internal Combustion Engines and Automobiles.

Three Credits. **Three Hours.**
First Semester.

The theory and design of gas, gasoline and oil engines, gas producer practice; the combustion of gaseous fuels. Prerequisite M. E. (20).

(22) Hydraulic Motors.

Two Credits. **Two Hours.**
Second Semester.

Action of water on curved vanes. Forces developed and effect of impact. Work done. Centrifugal action. Reaction turbines. Vane form and arrangement. Axial, radial and mixed flow wheels. Losses due to friction, shock, leakage and residual velocity Impulse turbines. Experiments with turbines of various types. Governors. Centrifugal pumps. Theory. Radial and curved vanes. Velocity of flow. Volute. Diffuser. Guide vanes in diffuser. Impeller passages. Balancing. Losses. Efficiency. Selection and arrangement of water-wheels. Governors and auxiliary apparatus. Relation between available water supply, possible output and perfection of development work. Draft tubes. Stop valves. Gates. Vacuum and pressure relief stand pipes. Analysis of typical installations. Water power costs.

Prerequisite C. E. (21).

(23) Industrial Engineering.

Three Credits. **Three Hours.**
First Semester.

The economic element in shop processes. Conditions for most economic production. Functional op-

eration of machine tools. Limits of economic production. Machines for performing specific operations. Time study. Labor saving devices in the shop. Distribution of cost of machine production between different processes, power, labor and material. Fixed charges. Layout of shops for most direct production. Layout of system of management and cost determining system. Prerequisite M. E. (13).

(24) Industrial Engineering.

Three Credits. **Three Hours.**
Second Semester.

Continuation of (23). Prerequisite M. E. (23).

(25) Heating and Ventilation.

Two Credits. **Two Hours.**
First Semester.

Theory and Design the various systems for heating and ventilating buildings, including Hot Air, Hot Water, Steam and the plenum and vacuum systems, and central station heating.

(26) Heating and Ventilation.

Two Credits. **Two Hours.**
Second Semester.

Continuation from (25). Prerequisite M. E. (25).

(27) Technical Literature.

One Credit. **One Hour.**
Second Semester.

Reading and reports from current Engineering literature.

MODERN LANGUAGES.

(1) French.

Four Credits. **Four Hours.**
First Semester.

In this course the student is carefully drilled in elementary grammar up to the irregular verbs, attention also being given to acquiring a vocabulary of the more common words.

(2) French.

Four Credits. **Four Hours.**
Second Semester.

A continuation of the preceding course. Special attention is given to the more important irregular verbs, the memorizing of words, and translation of French into English and vice versa.

(3) German.

Four Credits. **Four Hours.**
First Semester.

Elements of German grammar. Drill in pronunciation. Vocabulary.

(4) German.

Four Credits. **Four Hours.**
Second Semester.

A continuation of Course 3. Syntax. Oral and written exercises. Reading from the more simple German prose.

(5) Spanish.

Four Credits. **Four Hours.**
First Semester.

Elements of Spanish grammar. Drill in pronunciation. Vocabulary. Translations.

(6) Spanish.

Four Credits. **Four Hours.**
Second Semester.

Continuation of (5).

PHILOSOPHY.

(1) Philosophy.

Four Credits. **Four Hours.**
First Semester.

Lectures are given every week during both semesters of the Junior and Senior years on the various subjects treated in the more lengthy courses of the College of Philosophy and Letters.

(2) Philosophy.

Four Credits. **Four Hours.**
Second Semester.

Continuation of (1).

(3) Philosophy.

Three Credits. **Three Hours.**
First Semester.

Continuation of (2).

(4) Philosophy.

Three Credits. **Three Hours.**
Second Semester.

Continuation of (3).

PHYSICS.

(1) Mechanics, Molecular Physics, Sound.

Three Hours Lecture, Four Hours, Laboratory.
Five Credits. **First Semester.**

General principles of matter. General properties of Bodies. Equilibrium. Gravity. The balance. Laws of falling bodies. Pendulum. Properties peculiar to Solids. Hydrostatics. Capillarity, endosmose, diffusion, absorption. Hydro-dynamics. The properties of gases. Barometers. Measurement of the elastic force of gases. Aerodynamics. Production, propagation and reflection of sound. Measurement of the number of vibrations. The physical theory of music. Prerequisite—must be taking Eng. Math. (4).

(2) Light, Heat, Electricity.

Three Hours Lecture, Four Hours, Drawing.
Five Credits. **Second Semester.**

Transmission, velocity, intensity and reflection of light. Mirrors. Single refraction. Lenses. Dispersion and achromatism. Optical instruments. The eye. Sources of light. Phosphorescence. Double refraction. Interference and polarization. Properties of magnetism. Methods of magnetism. Properties of magnetism. Methods of magnetism. Laws of mag-

netic action. Terrestrial magnetism. Fundamental principles of frictional electricity. Quantitative laws of electric action. Distribution. Electro-static induction of influence. Electric machines. Condensation of electricity. Voltaic cell. Its modifications. Magnetic field due to current. Galvanometers. Ohm's law. Conversion of electric energy into heat. Thermo-electricity. Electro-dynamics. Electro-magnets. Magnetization of iron. Telegraphy. Electro-magnetic induction. Passage of electricity through gases. Magneto and dynamo electric machines. Diamagnetism. Connection between electricity and light. Physiological action of the current. Animal electricity. Prerequisite Phy. (1).

(3) Electrical Measurements.

Two Credits. **Two Hours.**
First Semester.

Elementary electro-statics. Electrification by friction, conduction and induction. Magnetism. Determination of horizontal force and magnetic moment. Fundamental experiments in Volatic electricity. The galvanoscope and the galvanometer. Determination of E. M. F. Wheatstone's bridge. Callibration of galvanoscope. Measurements of resistance. The high resistance differential astatic galvanometer. Measurement of galvanometer resistance. Thomson's method. Differential method. Use of slide meter bridge. Carey Foster's method. Measurement of very low resistances. The method of comparison of potentials, projection of equal potentials and auxiliary conductors. Measurement of high resistance. The

direct deflection method. Electrolyte resistance. Electrolytic resistance by alternating currents. The tangent galvanometer. Use of the standard galvanometer and the determination of E. M. F. Application of Joule's law. Use of potential galvanometer. Determination of the magnetic elements. Electro-magnetism and electro-magnetic induction. Action of linear current on magnet. Biot and Savart's law. Proof of electro-magnetic laws. Magnetic action of a solenoid. Laws of the electro-magnet. Induction experiments. Induction balance of Hughes. Damping. Comparison of resistance by magneto conductor. Use of earth inductor. Study of magnetic distribution. The condenser. Determination of the absolute capacity of a condenser. Electrometers. Prerequisite Phys. (2).

POLITICAL ECONOMY.

(1) Political Economy.

Two Credits. **Two Hours.**
Second Semester.

Object. Production, distribution, circulation and consumption of wealth. Production of wealth. Earth and natural agents. Labor and industry. Capital. Distribution of wealth. Individual property. Share of laborers. Circulation of wealth. Exchange. Taxes. Applications. This course is designed to give the student a broader view of his standing as a professional man in the community.

THE ASTRONOMICAL, METEOROLOGICAL AND SEISMOLOGICAL OBSERVATORY

JEROME SIXTUS RICARD, S. J.
Director.

ALBERT JOSEPH NEWLIN, B. S.
Assistant Observer.

Student Assistants:

Bert Mellott Hardy

Arthur Eugene Navlet

Edward Henry McLaughlin

Edwin Sebastian Booth

William Stewart Cannon

Institute of Law

INSTITUTE OF LAW

PURPOSES OF THE INSTITUTE OF LAW.

The purposes of the Institute of Law are:

To give a thorough training in the fundamental principles of English and American law, and the modifications thereof peculiar to the State of California;

To guide the student by actual practice in office work and court procedure to a proper application of the principles of law to concrete cases;

Finally, to imbue the student with the correct ethical principles that should govern the legal profession.

THE METHOD OF INSTRUCTION.

The method of instruction inevitably fixes the comparative value of the result. The student should solicitously seek the method which will best fit him for his practical work at the bar.

It is said that there are three systems now in vogue:

1. The Absolute Case System.
2. The Lecture System.
3. The Text Book System.

But a truer view perhaps is that there are but two systems:

1. A system by which the principles of the law are derived solely from the study and consideration of specific cases. This is the Absolute Case System.

2. A system by which the principles of the law are conveyed by means of treatises of eminent jurists or by means of lectures based in part upon the best treatises

and also upon original research and personal experience. This system does not exclude the use of cases. It employs them freely, but chiefly by way of illustration and to give the student practical aid in the intelligent handling of reports and the weighing of decisions.

The Case System was inaugurated by Harvard in 1871 and the same course is pursued also in the law schools of the following universities, namely: Wisconsin, New York, Northwestern, Illinois, Chicago, Fordham, Cornell, Minnesota, George Washington (D. C.), Iowa, Maine, Louisville, Nebraska, Missouri, Pennsylvania, California, Leland Stanford Jr., Hastings Law School and probably many others. In the Northwestern University we are told that each instructor employs the case system "according to his own judgment, conducting the class by lectures, discussions, recitations, written exercises, or in any way he deems best adapted to the subject."

Even Harvard, as appears from the most recent circular of that university, does not assume that the student's sole source of legal knowledge is the case book or the professor's explanations thereof; but permits and doubtless expects him to illuminate the study of the case under consideration, by the reading of the best treatises on the subject.

The second or composite system seems to be growing rapidly in favor. It is used in the following universities and law schools: The National University, Michigan, Indiana, Georgia, Mercer, Kansas, Georgetown, Catholic University, The New York Law School, Tennessee, St. Louis, Chattanooga, Vanderbilt, Albany, Loyola, Southern California, Cumberland, Notre Dame,

Montana, Boston, St. Paul, Pittsburg, Colorado, Colorado College, Mississippi, Virginia, Ohio, Washington University in St. Louis, and doubtless many others. The Cincinnati Law School is claimed as a case school but its catalogue contains a schedule of lectures for the current school year covering every important topic of the law. The New York Law School has issued a most convincing brief against the exclusive case system. The Southern Law schools in general maintain a high standard of merit and excellence. They are practically unanimous in the conclusion that it is impossible for an exclusive case system to produce a well equipped lawyer. They strongly favor the use of the ablest treatises, and surely it is not without reason that they urge that the master works of our Kents and Minors and Bishops and Wigmores, and their illustrious fellows, representing a life-time of specially skilled labor in the critical consideration and comparison of tens of thousands of cases, should not go unutilized in the preparation of young men for the bar.

The strongest objections to the absolute case system as the sole source of legal equipment seem to be deducible from the arguments of its advocates. A student of botany would surely be unwise not to avail himself of the storehouse of facts ready at hand, crammed with the results of the life-long observations of men peculiarly fitted for the work. A student of chemistry would seem to be out of his mind if instead of acquainting himself with the results of probably a hundred times as many experiments as his brief course of a few years would permit him to make in a university, he should attempt in that inadequate period to recon-

struct for himself the grand proportions of the temple of chemical knowledge. "Ah, but he will have aid." Then if he is to have aid, he should have the best aid and the most aid within his reach. He should possess himself of all the garnered knowledge of the science, the product, it may be, of the labors of a host of gifted men. And every step in it will but verify and illustrate a small part of what he already knows.

The medical student cannot master the science of medicine or even of surgery by mere attendance upon hospitals and could certainly never get a license to practise by that course alone. More than that, if he had first filled his mind with the medical learning of the books, the hospital experience itself would have infinitely more value and significance to him. The ordinary student of history cannot go to the sources. Such work should be done thoroughly or not at all and for him life is too short for that. Even the professional historian must restrict his researches to a small part of the entire field. Is it not the same with the law student? If he is going to the sources merely to gain practice in dealing with decisions, a moderate amount of such work only should be done or it will seriously interfere with the main purpose of his legal course, namely; the acquisition of legal knowledge. If on the other hand that is to be his sole source of learning, then he should not merely dip his fingertips into it. He should go into it exhaustively. If he is not in any way to have the benefit of the works of the approved legal authors either directly or through the medium of lectures, then what they all did collectively he must do singly, to reach the same results. But that is impossible, even

though he gave his whole life to it. As an example let us consider Bishop on Contracts. Here in 600 pages, based upon nearly 11,000 cases, is presented the work of a legal genius, a man of fine, analytical, judicial mind, a skilled expert, *whose opinions are the most valuable part of the work.* Compare this master work with Huffcut and Woodruff's Cases on Contract, containing 267 cases and citing 500 cases. The cases are most wisely selected, but will any one seriously contend that any amount of familiarity with this case book will give the student the knowledge of contracts he could gain from Bishop or from lectures conveying the same matter? The case book should be regarded not as a rival or substitute, but as a supplement and an auxiliary to the treatise or lecture.

The professors of The Institute of Law, who are mostly men of long experience in the practice of law, are of one mind, namely: that a fair compliance with the rule of the Supreme Court of California, which requires a knowledge on the part of an applicant for a license of Blackstone, Kent, Greenleaf, Story, Gould, Lube, Parsons and Pomeroy, demands that the results of the labors of these great workers in the vineyard of the cases and of others such as they should be given to the student; they are of the opinion that the case book should be used solely to illustrate certain principles so acquired and to give experience in the critical examination of opinions, the recognition of dicta and the ascertainment of the exact value of decisions; that it lies in the realm of practice rather than of the acquirement of legal knowledge, and that legal knowledge should be gained connectedly and as a compact

and symmetrical whole. Upon any one of the authors mentioned, a long list of important questions could be framed, the answers to which would be unknown to the student of the case book on that subject, because outside of his field of knowledge—outside of the inevitable limitations of the case book. For example, the most faithful and brilliant student of the case books of Fetter, and Huffcut and Woodruff, on Equity and Contracts respectively, could not hope to pass unscathed through a searching examination upon the text of Story on Equity Jurisprudence or of Parsons or Bishop on Contracts.

Moreover, a most important consideration is this, that the cases in the case books *were not decided for the instruction of students;* so a case containing a principle which lies at the threshold of a subject may also contain a principle which would come in the very last chapter of a treatise on that subject. Then, too, the diction of judges is intended for lawyers, not for students.

The strongest practical proof of the inadequacy of the exclusive case system is the constantly increasing amount of "piecing out" found in the case books of the most eminent editors, in a kind of desultory effort to fill up in some measure the obvious gaps left by the cases. What can all this result in, in effect, except an imperfect and disjointed treatise?

THE SPECIFIC PLAN ADOPTED.

Accordingly a portion of the time devoted to each subject is, at each session, given, first, to a lecture based upon and conveying in a manner suited to the

purpose, the substance of the master commentators of the law upon the special topic being presented, supplemented, when necessary, by recent decisions, showing a change or further evolution of the law. Among the writers whose renown is as assured in law as that of Euclid in geometry, no one is always and continuously pre-eminent. "Quandoque bonus dormitat Homerus." An author may be unquestionably foremost in his general treatment of a subject and yet be less satisfactory than another at one point and than still another at a second point. One may be best in the statement of a principle and the conclusions which flow from it; another most useful in the illustrations given to support the principle. It is the lecturer's province therefore to give and elucidate the best that can be gathered from *all* the masters on the subject of the lecture.

A second portion of the time is given to a brief examination upon the previous lecture and occasionally a review of all the ground traversed. A third portion is devoted to giving out facts from actual cases to be solved at the next session of the class and to hearing the solution of similar legal problems given out at a prior session. This is found to awaken a lively interest, to engrave the remembrance of principles deeply on the mind, to correct mistaken notions of their meaning, and to test and develop the student's power of applying principles to concrete facts. The benefit from this is similar to that derived from working out by one's own efforts a problem in geometry, while the case book gives him problems fully worked out. Lastly comes the case book and the most zealous advocate of the exclusive case system would be surprised to note the

ground traversed and the intelligent, excellent work which can be done in this line by students so prepared for it.

PRACTICE COURT.

The Institute of Law maintains a system of practice courts which is modeled essentially on the California system of courts of record, and consists of the Superior Court, the District Court of Appeal and the Supreme Court.

The Superior Court is presided over by a member of the Faculty, at present Hon. William Arthur Beasly, Judge of the Superior Court, San Jose, Cal. The court holds weekly sessions at which business is transacted in the manner usual before state courts, with the constant instruction, advice and correction of the presiding judge. On given statements of fact, student counsel issue, serve and return regular process, prepare and file the proper pleadings according to the California Code practice, argue demurrers, impanel juries, examine witnesses, and in brief, carry their cases through from summons to final judgment.

Every student in good standing is admitted to the bar in the middle of his second year in the school, and is required to act as counsel in not less than two cases in every semester. Subordinate officers of the court, are chosen from the more experienced of the students, while the clients, witnesses, and jurymen are drawn from among the beginners. All students are required to attend every session of the courts and they receive credit therefor.

The District Court of Appeal and the Supreme Court

hold sessions as often as business requires. They are also under the general supervision of a member of the Faculty, at present Hon. John E. Richards, Judge of the District Court of Appeal for the First Appellate District.

Court is held in a specially furnished court-room.

Lectures on particular phases of the law are given from time to time by the Faculty and by occasional lecturers.

PHILOSOPHY AND POLITICAL ECONOMY.

Thorough courses in Philosophy and Political Economy covering a period of two years are offered by the University in the College of Philosophy and Letters.

All law students who are candidates for the Degree of Bachelor of Arts or Bachelor of Science are required to follow these courses.

Other law students are urged to do so but not obliged.

The Faculty strongly recommend all students to take advantage of these courses because they are of great value in developing the reasoning faculties and in grounding the student in sound principles of ethical conduct—two things absolutely necessary to the soundest and highest success in the legal profession.

SESSIONS AND HOURS.

The school year in the Institute of Law is the same as that for the University in general. It consists of two semesters:

September 2, 1914, to January 30, 1915.

February 1, 1915, to June 9, 1915.

Thanksgiving recess: November 25 to 30, 1914.

Easter recess: March 31 to April 7, 1915.

Classes in Philosophy and Political Economy are held during morning hours except on Wednesdays. The length of the periods is fifty minutes.

Classes in legal subjects are held every evening, Wednesdays included, at 6:55, and also on Saturday afternoons at 1:30. The length of the period varies from one to one and one-half hours. There are two such periods every evening, making a total of fourteen class-hours in legal subjects.

ENTRANCE REQUIREMENTS.

The Institute of Law is open to the following classes of students:

1st. Those who have the degree of Bachelor of Arts, Bachelor of Science, or their equivalent, from this or some other college or university.

2d. Those who have completed the first two years of college work either at this University or at some other college or university, offering satisfactory courses leading to academic degrees. Students of this class may complete their college work by following the Junior and Senior courses of Philosophy in the College Bachelor of Arts or Bachelor of Science at the end of of Arts and Sciences, and thus receive the degree of their second year in the Institute of Law, and the degree of Juris Doctor or Bachelor of Laws (according to their qualifications) at the end of the third.

Students of the first and second classes are **regular students.**

3d. Those whose experience in business or whose

private study has made up for their lack of collegiate training and whose maturity and seriousness fits them in the discretion of the Faculty, for the study of law. Such are for example young men employed in insurance and real estate offices, banks, railroad offices and law firms, as well as those who have studied privately and so acquired knowledge for which, because of its variety and mode of acquisition, educational institutions are unable, as a rule, to give credit. These are **special students.**

Advanced standing. Any person who, after becoming entitled to enter the Institute of Law as a regular or special student, has been in regular attendance for at least one academic year at another law school, having similar admission requirements, may in the discretion of the Faculty of the Institute of Law, and on such terms, with or without examination, as it may prescribe, receive credit for the work done at such other law school not exceeding in any case two years. The last year must be spent in residence in the Institute of Law.

THE COURSES.

New subjects are entered upon at the beginning of each semester, thus ensuring concentration of attention on a few subjects at a time, and also making it convenient for students to enter in February as well as in September.

Pre-Legal.

Elementary Law.

Three Hours, Two Semesters.

This course is given principally to students in the

Sophomore year of the College of Letters and of General Science, who intend to enter the Institute of Law in the next year.

Robinson's Elementary Law, 2d Ed.

Mental Philosophy, Moral Philosophy, Psychology and Political Economy.

The regular courses in these subjects, given in the College of Letters and of General Science, are open to all students of the Institute of Law.

First Year.

The subjects taught in the first year of law do not vary from year to year.

Criminal Law.

One and One-Half Hours, First Semester.

Mikell's Case on Criminal Law and Procedure.

Criminal Procedure.

One and One-Half Hours, Second Semester.

This course is conducted in a practical manner and includes the preparation of criminal pleadings, and the court work incidental to trials for crime. The professor sits as a judge, with the students as officers, jurors and witnesses.

Penal Code of California and selected California Cases.

Mikell's Cases on Criminal Law and Procedure.

Torts.

Four Hours, Second Semester.

Burdick's Cases, Third Ed.

Personal Property.

Four Hours, First Semester.

Lectures and Goddard's Cases on Bailments and Carriers.

Agency.

Two Hours, First Semester.

Huffcut's Cases.

Common Law Pleading.

Four Hours, Second Semester.

Whittier's Cases.

Contracts.

Four Hours, First Semester.

Huffcut & Woodruff's Cases, Second Ed.

Practice Court.

One and One-Half Hours, Both Semesters.

Attendance at all sessions and service as jurors, witness or officers is required.

Debating.

One and One-Half Hours, Both Semesters.

Second and Third Years.

These courses are pursued together by students of the second and third years, and with the exception of the Practice Court, Debating, Roman Law and International Law, vary from year to year, but in such a way that at the end of the third year in attendance the student has seen all the important branches of the law.

Practice Court.

One and One-Half Hours, Both Semesters.

All second year students are admitted to practice at

the first session of the Practice Court as explained above.

Debating.

One and One-Half Hours, Both Semesters.

Courses Given in 1914-15 and in Alternate Years Thereafter.

Domestic Relations.

Two Hours, First Semester.

Woodruff's Cases, Second Ed.

Trusts.

Two Hours, Second Semester.

Kenneson's Cases.

Code Pleading.

Two Hours, First Semester.

Hinton's Cases.

Master and Servant.

Two Hours, Second Semester.

The general law of Master and Servant, with particular reference to statutory provisions in California, especially The Workmen's Compensation, Insurance and Safety Act, as well as Federal statutes on the subject.

California Code and Statutes with selected California Cases.

Constitutional Law.

Three Hours, First Semester.

Boyd's Cases, Second Ed.

Private Corporations.

Three Hours, Second Semester.

Warren's Cases.

Wills and Probate Law.

Four Hours, First Semester.

Costigan's Cases.

Evidence.

Four Hours, Second Semester.

Wigmore's Cases.

New Trial and Appeal.

Two Hours, Second Semester.

Open to Third Year students only.

Lectures, Code of Civil Procedure and California Cases.

Courses Omitted in 1914-15; Given in Alternate Years Thereafter.

Equity.

Three Hours, One Semester.

Throckmorton's Cases and Eaton on Equity.

Bills and Notes.

Four Hours, One Semester.

Smith & Moore's Cases.

California Practice.

Two Hours, One Semester.

Lectures, Code of Civil Procedure of California and selected California Cases.

Real Property.

Four Hours, One Semester.

Finch's Cases.

Conflict of Laws.

Two Hours, One Semester.

Dwyer's Cases, Second Ed.

Partnership.

Two Hours, One Semester.

Gilmore's Cases.

Insurance.

Two Hours, One Semester.

Richard's Cases.

The following additional work must be done privately under the supervision and direction of a member of the Faculty, by all candidates for the degree of Juris Doctor:

Roman Law.

Written examinations as in other law courses, i. e., monthly and at the end of each semester.

Sohm's Institutes, Ledlie's Translation.

International Law.

Written examinations as in other law courses, i. e., monthly and at the end of each semester.

Taylor's International Law.

SUMMARY.

Pre-Legal.

	Hours 1st Semester	Hours 2d Semester
Elementary Law	3	3

First Year.

Criminal Law	1½	
Criminal Procedure		1½
Torts		4
Personal Property	4	
		1
Agency	2	
Common Law Pleading		4
Contracts	4	
Practice Court	1½	1½
Debating	1½	1½
	14½	13½

Second and Third Years.

Domestic Relations	2	
Trusts		2
Code Pleading	2	
Master and Servant		2
Constitutional Law	3	
Private Corporations		3
Wills and Probate Law	4	
Evidence		4
New Trial and Appeal 3d Yr. only		2
Practice Court	1½	1½
Debating	1½	1½
	14	16

EXAMINATIONS.

Written examinations are held monthly in all subjects. Written examinations are also held twice a year on the work of the preceding semesters.

Oral examinations. In addition to the above-mentioned written examinations, at the end of the school year, each student must present himself before an examining board of not less than three members of the Law Faculty and be orally examined by them for forty minutes on the work of the past school year.

The general provisions set out elsewhere in this catalogue relating to Examinations, Promotions, Conditions and Re-examinations, Attendance and Credits, apply to all students of the Institute of Law. Reference is made to them for fuller information.

GRADUATION.

The Faculty of the University reserve the right to make the conditions stricter than they now are for entrance and for graduation, and to provide if they see fit, that such changes when made shall affect all students enrolled in the Institute of Law on or after September 2, 1914.

The following regulations shall apply to all students who enter the Institute of Law on or after September 2, 1914:

In order to graduate, the student must have completed the regular course of the Institute of Law. This implies:

1. Credit for at least eighty-four credit hours (a credit is the equivalent of one hour a week for one

semester). No one is allowed a credit in any course at which he has not been present ninety per cent of the class hours, and in which his average is not at least passing (seventy per cent).

2. Residence of at least three years in a standard law school, one year of which must have been spent in this Institute of Law.

3. The submission of a satisfactory thesis on some legal question selected by the student and approved by the Faculty. Said thesis must be submitted in accord with the following

Regulations.

The thesis must contain not less than five thousand words.

It must represent original work and thought.

It must consist of a thorough discussion of the cases bearing upon the subject, and must not be a mere series of extracts from cases or treatises, loosely strung together.

Pertinent authorities must be cited by giving the volume and page, and also the particular page referred to. In addition to the ordinary citation, the writer should also give the place where the same case may be found in the selected case series and the Reporter system.

It must be in typewriting on paper 8½ by 10¼ inches in size.

The submission of an acceptable thesis is an absolute pre-requisite to admission to final examinations.

4. In addition to the above requirements, candidates for the Juris Doctor degree must pass all required tests in Roman and International Law.

DEGREES AND CERTIFICATES.

Having thus qualified for graduation, the student will be given either the Degree Juris Doctor (J. D.), the Degree of Bachelor of Laws (LL. B.) or a certificate stating that he has satisfactorily completed the courses in legal subjects given in the Institute of Law.

The Degree of **Juris Doctor** will be conferred upon the following classes of students:

1st. Those who entered with the degree of A. B. or B. S., or their equivalent from this University or a college or university of recognized standing.

2d. Those who, having entered with credit for the first two years of college work, have completed the courses in Philosophy and Political Economy along with their legal studies and have received the degree of A. B. or B. S. from this University.

The Degree of **Bachelor of Laws** will be conferred upon the following classes of students:

1. Those who, having entered after the completion of the first two years of college work, have confined themselves to law and have maintained throughout their course an average of eighty-five per cent in every subject.

2. Those who, having entered after the completion of the first two years of college work have done satisfactory work in some subjects included in the courses in Philosophy and Political Economy, such work being insufficient to warrant conferring on them the degree of A. B. or B. S., and who have, in addition, maintained throughout their course an average of eighty-five per cent in every legal subject. Where a student has done such work, but, while reaching a passing mark, has

fallen below said average of eighty-five per cent in every legal subject, he may nevertheless be awarded the degree of Bachelor of Laws, by special action of the Faculty, the degree of allowance made him being proportioned to the number of hours' work satisfactorily done in Philosophy and Political Economy.

The **Certificate** will be conferred upon the following classes of students:

1. Special students who have throughout their course maintained an average of eighty-five per cent in every legal subject.

2. Special students, who, in addition to their work in law have done satisfactory work in the courses in Philosophy and Political Economy or some subjects included therein, and who have also maintained an average of eighty-five per cent in every legal subject. Where a student has done such work, but, while reaching a passing mark has fallen below said average of eighty-five per cent in every legal subject, he may nevertheless be awarded the certificate, by special action of the Faculty, the degree of allowance made him being proportioned to the number of hours' work satisfactorily done in Philosophy and Political Economy.

ADMISSION TO THE BAR.

It is provided by amended Section 280b of the Code of Civil Procedure of the State of California that any person producing evidence of having satisfactorily completed the three years' course of law prescribed by the Institute of Law of the University of Santa Clara, shall be entitled to a license to practice law in all the courts of this state, subject to the right of the Chief

Justice of the Supreme Court of the State to order an examination, as in ordinary cases of applicants without such diploma or other evidence.

Expenses are full set out elsewhere. *See "Expenses in all the Departments of the Univcrsity."*

THE SUPERIOR COURT

of the

UNIVERSITY OF SANTA CLARA

1913-1914

HON. WILLIAM ARTHUR BEASLY, LL. B.
Judge.

John Joseph Jones, A. B.
Clerk (First Semester)

Emil Orpheus Coschina,
Bailiff (First Semester)

Max Michel,
Clerk (Second Semester)

Louis Thomas Milburn,
Bailiff (Second Semester)

REGISTER OF LAW STUDENTS.

Ext.: Student residing outside the University.
Res.: Student residing within the University.
Jr.: In Junior Philosophy and Political Economy.
Sr.: In Senior Philosophy and Political Economy.

Third Year.

Boone, Francis Griffin		Ext.	Modesto
Bowden, Lawrence Archer, B. S. University of California, '10		Ext.	San Jose
Bronson, Royal Andrews, A. B. '12, A. M. '13.		Res.	Oakland
Degnan, Christopher Aloysius, A. B. '12.		Ext.	San Francisco
Holm, Dion Raphael A .B. '12.		Ext.	San Francisco
Jones, John Joseph A. B. '08.		Ext.	Santa Clara
McGowan, Harry William A. B. '13.		Ext.	Paraiso Springs
Newlin, Albert Joseph B. S. '13.		Res.	New York, N. Y.
Riordan, Thomas Justin A. B. '11, A. M. '12.		Ext.	San Jose
Tramutolo, Chauncey Francis B. S. '12.		Ext.	San Jose
White, Edward Gerald B. S. '12.		Ext.	Watsonville
White, Stephen Mallory A. B. '13.		Ext.	Watsonville
Zarick, Marco Samuel B. S. '12.		Ext.	Sacramento

Second Year.

Bressani, Richard Valentine A. B. '13.		Ext.	San Jose
Concannon, John Martin	Sr.	Res.	Los Angeles

Coschina, Emil Orpheus	Jr.	Ext.	San Jose
Kiely, Michael Antony		Res.	Los Angeles
McKinnon, Harold Richert	Sr.	Res.	Arcata

First Year.

Boone, Thomas Charles		Res.	Modesto
Booth, Edwin Sebastian	Jr.	Res.	Seattle, Wash.
Bothwell, Floyd Manning	Jr.	Res.	Los Angeles
Canelo, Adolph Briones	Jr.	Ext.	San Jose
Carey, John P.		Ext.	Boston, Mass.
Caspers, Rudolph	Jr.	Ext.	San Jose
Fitzpatrick, James Peter	Jr.	Res.	Los Angeles
Ford, Edward Byron	Jr.	Ext.	San Jose
Gianella, Leo James	Jr.	Res.	Honcut
Griffith, Michael Edward A. B. '98.		Ext.	San Jose
Hurd, Clinton Emmett		Res.	Fresno
Lenahan, John Thomas		Ext.	Wilkesbarre, Pa.
Martin, Philip Patrick	Jr.	Res.	San Diego
McDowell, Herbert		Ext.	Fresno
Meadows, George Rush	Jr.	Res.	Los Angeles
Michel, Max		Ext.	San Jose
Milburn, Louis Thomas	Jr.	Res.	Mariposa
Serpa, Louis		Ext.	San Jose
Shipsey, William Thomas	Jr.	Res.	San Luis Obispo
Willey, Frank Allen		Ext.	San Jose

School of Pedagogy

THE SCHOOL OF PEDAGOGY

The growing demand for young men in the teaching profession, in which male teachers are comparatively few, is being met by the Colleges and Universities of the United States in various ways.

The University of Santa Clara has not neglected to do her part in this work, though for the most part her graduates who have entered the teaching profession have found congenial employment in the Preparatory or High School of the University. With the growth of the teaching profession and the increased demand for male teachers and the increased salaries offered teachers, it is but natural that in the coming years an ever increasing number of young men will elect to follow this noble calling which possesses such a fascination for men who have the gifts requisite for such work.

The University offers the following special courses in pedagogy. The student will find in them in due proportion the history, theory and practice of education. The practical work in education is conducted in the Preparatory Department of the University, under the direction of experienced teachers.

Course 1. History of Education.

Three Hours, One Semester.

A historical treatment of the various systems of education in ancient, medieval and modern times.

Course 2. Systems of Education.

Two Hours, One Semester.

A study of the principal systems of education. The

various principal systems are first studied by themselves and then a comparative study is made.

Course 3. Educational Psychology.

Three Hours, One Semester.

A brief course in psychology and the bearing of certain psychological facts on the work of education. Mental development. Instincts. Individuality.

Course 4. Child Study.

Two Hours, One Semester.

A special course in the psychology of childhood. Physical and mental development.

Course 5. Philosophy of Education.

Two Hours, One Semester.

The definitions of education. False notions of education. The principles underlying all education.

Course 6. Education in Theory and Practice.

Two Hours, One Semester.

A more detailed study of the theory of education; educational methods. Actual practice in the classroom.

Course 7. Classroom Management.

Two Hours, One Semester.

Discipline. Order. Forms of discipline. Factors in discipline.

Course 8. High School Administration.

Two Hours, One Semester.

History and place of the High School in the American Educational System. Programs of studies. Divisions of time. Order of Classes. Making of pupils. Records. Reports. Texts. Teachers.

Pre-Medical Course

THE PRE-MEDICAL COURSE

This course offers those studies in Chemical and Biological sciences which are required for admission to the best schools of medicine. A period of two years is needed to complete this course, and it is open to students of the Senior and Junior years of the College of Letters and Sciences only.

Course 1. General Biology. Botany.

Six Hours, One Semester.

The seed. Structure. Chemistry of food supply. Dicotyledenous and monocotyledenous forms. Germination. Enzymic action. Development of seedling. The root, and study of osmosis. The stem. Vascular system. The leaf. Nature of work and study of stomata. Endogenous and exogenous growth. Fertilization and structure of flower. Thallophyta. Algae. Kelp, spirogyra. Cladophora and similar types. Fungi. Reproduction in the Thallophyta and evolution of sex. Biophyta. Pterodophyta. Study of forms and various methods of reproduction. Brief consideration of zonation.

Course 2. General Biology. Cytology and Zoology.

Six Hours, One Semester.

The cell. Anatomy and metabolism. Protoplasm. Karyokinesis. Maturition. Reproduction. Theories of evolution and heredity. Heredity and Mendelism. Colloidal and crystalloidal states of matter. Protozoa.

Porifera. Ceolenterata. Echinodermata. Molusca. Arthropoda. Chordata. Types of each studied and dissected. Special study of the rabbit and cat. Brief comparative anatomy. Personal hygiene.

Courses 1 and 2 are given with copious laboratory experiments.

Course 3. General and Special Histology.

Three Hours, One and One-Half Semesters.

The cell. Epithelial, connective, muscle and nerve tissues. Circulatory and lymphatic system. Alimentary tract. Digestive glands. Respiratory, urinary and genital system. Skin and its appendages. Eye. Ear. Senses of smell, touch and taste.

Course 4. Histology. Laboratory.

Four Hours, One and One-Half Semesters.

Use of microscope. Preparation and examination of unstained tissues. Spreads and teased preparations. Slide technic with paraffin and celloidin.

Course 4 accompanies Course 3.

Course 5. Bacteriology.

Three Hours, One-Half Semester.

Brief course including the definition and history of science. Nature and classification of bacteria. Their morphology, grouping, mode of multiplication, spore formation, motility. Principles of sterlization. Principles involved in the methods of isolating bacteria. Study of different culture media. Principles of aerobic and anaerobic cultures. Morphology, pathology, and biological properties of the more important bacteria.

Principles of toxins, antitoxins, agglutinins, precipitins and vaccins.

Course 6. Bacteriology. Laboratory.

Four Hours, One-Half Semester.

Preparation of agar-agar tubes and Petri plates. Study of colonies. Stab cultures and slant cultures. The common staining methods.

Course 6 accompanies course 5.

All these courses are given with copious laboratory experiments.

For the course of Chemistry to be taken by Pre-Medical students see Chemical Courses for the Colleges of Letters and Science.

Courses 2, 3, 6 and 7 are taken during the Freshman year. Courses 6, 8 and 9 are taken during the Junior or Senior year.

For the course of Physics, see Courses in that subject for the College of Letters and Science.

The study of German or French covering a period of two years, is also required.

Commercial Department

COMMERCIAL DEPARTMENT

These courses require a definite amount of work, but the time for completion depends entirely upon the ability and the application of the student. Free range is given to individual effort. The course of study is so arranged that studies in other departments of the University may be pursued also. The general and the technical subjects are combined to give mental discipline and general culture, at the same time preparing the student for the practical affairs of business. All students in this Department are required to attend one of the English courses in the Preparatory or High School Department.

Besides written examinations, each candidate for graduation is orally examined by a committee of the Faculty for thirty minutes in all the subjects seen during the past year.

The general provisions regarding Attendance, Examinations, Promotions, Conditions, etc., set forth elsewhere in this catalogue, apply also to this Department.

Upon graduation, each student is given the Commercial Certificate.

First Year.

Course 1. Elementary Bookkeeping.

Five Hours, One Semester.

Using from the first, sales-book, purchase-book, cash-book, journal and ledger. Drills in journalizing, statements, business forms. Text: Rowe.

Course 2. Wholesale Set.

Five Hours, Second Semester.

With the special features of columnar work, controlling accounts, general ledger and sales ledger, analysis sheets, note books as posting mediums, loose leaf sales book, posting from orders, and valuable drills in arithmetic and commercial paper, several different forms of balance sheets. Text: Rowe.

Second Year.

Course 3. Commission Set.

Five Hours, First Semester.

Use of twenty column cash-journal account-sales register, business letters, bill of lading, commission sales book, bill and charge system, card ledger, elementary work in opening and closing corporation accounts and advanced financial statements. Text: Rowe.

Course 4. Banking.

Five Hours, Second Semester.

Both cash book and journal methods. Practical training in Bank bookkeeping and the duties of Bank officers and clerks. Clearing-house explained and practically illustrated by the handling of all business papers of commerce followed by practice in the two College Banks which clear and balance cash book daily. Exchange, Loan and Collection departments are conducted. Trial balances, statements and remittances to Correspondents are made weekly and Bank Examiner reports regularly. Texts: Rowe, Ellis, Goodyear.

Third Year.

Course 5. Cost Accountancy.

Three Hours, First Semester.

Illustrating shop management, voucher system, changing partnership to corporation, reserve and surplus accounts, internal checks, stock book, cost sheets and highly classified trading and financial statements. Text: Rowe.

Course 6. Electives.

Three Hours, Second Semester.

Real Estate and Insurance Set, Railway Accounting and Farm Accounting. These Sets illustrate the use of insurance policies and registers, preparing and filing deeds and mortgages, leases, protesting, acknowledgements, bill of lading, abstracts of title, railway stationery, Freight Cash Book, Freight Forwarded and Received Book, telegrams, and some entirely new features in farm bookkeeping. Text: Goodyear.

Course 7. Bookkeeping and Accounting Problems.

Two Hours, Second Semester.

Part Two—Bennett. During these periods the theory of bookkeeping is discussed in all its forms, and demonstrated by practical application. The work is prepared by the student out of class, critically examined by the instructor and returned with corrections marked.

Course 8. Business Law.

Two Hours, First Semester.

Through problems and quizzes the student is made

familiar with all the usual customs and business forms; with contracts, their operation and discharge, sale and bailment of goods, credit and loans, guaranty, negotiable instruments, agency, master and servant, partnerships and joint-stock companies, corporations, real and personal property.

Course 9. Business Practice and Administration.

Five Hours, Two Semesters.

Here the student learns bookkeeping **practically** by recording the transactions as they arise not knowing before what will take place. There is buying and selling, money to pay and money to receive, credit given and credit allowed; checks, drafts, notes, receipts, invoices, statements, etc., to receive, to deliver, and to make record of—every phase of actual business exemplified. The student must show at all times what he knows. There is a different set of transactions for every student. The Ellis Cabinet-Card System is used.

Course 10. Business Spelling.

Three Hours, Two Semesters.

Including a study of roots, prefixes, suffixes, syllabication, diacritical marks, spelling rules, defining words, and their use in sentences. Text: Marshall.

Course 11. Penmanship and Dictation.

Five Hours, Two Semesters.

Particular attention is given to position, form, movement and speed. Daily drills are given on various movement exercises, to help get smooth lines, to establish correct pen-holding, to loosen the muscles, to increase

the speed, to fix firmly the habit of correct movement, and thus lay the foundation for a good business hand. Speed practice is a special feature of the course. Text: Zaner.

Course 12. English Essentials and Letter Writing.

Two Hours, Two Semesters.

Special attention devoted to correcting the students' deficiencies and developing accuracy in grammar, punctuation, the use of words and discrimination of synonyms. The student writes a series of business letters, in accordance with data and conditions furnished by the instructor who carefully examines, marks for correction and returns them to the student to be rewritten. Text: Ellis.

Course 13. Business Arithmetic and Rapid Calculation.

Five Hours, Two Semesters.

Addition drills, invoice extension, percentage as applied to business problems, profit and loss, commission, trade discounts, insurance, interest by banker's method training the student to solve the various problems with the fewest possible figures, Banker's daily balances, saving accounts, exchange, metric system, equations and cash balance, dividends and investments, partitive proportion, partnership and storage. Short practical methods emphasized. Text: Moore and Miner, McIntosh.

Course 14. Auditing.

Two Hours, One Semester.

Work consists of experting books in Business Department, and problem work furnished by the instruc-

tor, the scope and conduct of an audit, errors of ignorance, fraud and mistake, kinds of audits, their purposes and advantages, duties and qualifications of an auditor, balance-sheet audit, the detailed audit, corporation tax law and depreciation, bank, mercantile and manufacturing audits, investigations, liabilities of auditors and directors, certified public accountant laws and examinations. Text: Montgomery.

Course 15. Office Practice.

Five Hours, Two Semesters.

Course 16. Office Practice.

Five Hours, Two Semesters.

Each student at some time during his course enters and conducts all of the offices, which include two banks, two wholesale houses, commission house, real estate and insurance and freight office. He learns how to use the adding machine in making statements, checking invoices and trial balances, figuring interest and summarizing. Modern methods of bookkeeping are used exemplifying columnar books, controlling accounts, trial balance proofs, loose-leaf ledgers, filing systems and billing machine. He becomes a stockholder and attends business meeting, learning parliamentary usages. Daily cash balances and reports are made, including check figures and figure trial balances.

Course 17.—Shorthand and Typewriting.

Ten Hours, Two Semesters.

The Pitmanic system of shorthand is taught, and as its value to a student is ordinarily measured by his gen-

eral English education, it is recommended only to the advanced student. The object of the instruction in typewriting is to impart a correct scientific method of fingering and a skillful, uniform touch, and to train the students in all the details of form and arrangement of transcript. The work includes business letters of all kinds, tabulated statements, articles of agreement, certificates of incorporation, the writing of a will and other legal forms. Text: Howard-Pitman Manual; Van Benthuysen's Sentence Method of Touch Typewriting.

Preparatory Department

HIGH SCHOOL OR PREPARATORY DEPARTMENT

First Year.

Course 1. Latin.

Eight Hours, One Semester.

Precepts: Etymology and Syntax. Text: Pearson, Essentials of Latin. Authors: Caesar, Selections. Practice: Themes.

Course 2. Latin.

Eight Hours, One Semester.

Precepts: Etymology and Syntax. Text: Pearson, Esentials of Latin. Authors: Caesar, Gallic War. Practice: Themes in Imitation.

Course 3. English.

Five Hours, One Semester.

Precepts: Scott & Denney's Elementary English Composition, first half. Authors: Irving, Sketch Book, Lamb's Tales from Shakespeare. Practice: Weekly Compositions.

Course 4. English.

Five Hours, One Semester.

Scott & Denney's Elementary English Composition, second half. Authors: Macaulay, Lays of Ancient Rome. Scott, Ivanhoe. Practice: Weekly Composition.

Course 5. Religion.

Two Hours, One Semester.

Christian Doctrine. Baltimore Catechism thoroughly reviewed. Kinkead's Explanation of the Baltimore Catechism.

Course 6. Religion.

Two Hours, One Semester.

Kinkead's Explanation of the Baltimore Catechism.

Course 7. Mathematics.

Five Hours, One Semester.

Algebra. Text: Well's Algebra, from beginning to factors inclusive.

Course 8. Mathematics.

Five Hours, One Semester.

Algebra: Text: Wells' Algebra, from factors to quadratics inclusive.

Course 9. History.

Five Hours, One Semester.

The Ancient Nations, and Greece. Text: Morey's Outlines of Ancient History.

Course 10. History.

Five Hours, One Semester.

Roman History to Charlemagne. Text: Morey's Outlines of Ancient History.

Second Year.

Course 11. Latin.

Eight Hours, One Semester.

Precepts: Etymology and Syntax reviewed in analy-

sis work. Authors: Caesar, Gallic War, two books; Gunnison & Harley's Edition. Practice: Themes in Imitation.

Course 12. Latin.

Eight Hours, One Semester.

Precepts: Syntax reviewed in analysis work, concluded. Themes in Imitation. Authors: Caesar, Gallic War, two Books; Gunnison & Harley's Edition.

Course 13. English.

Five Hours, One Semester.

Precepts: Donnelly's Imitation and Analysis. Authors: Scott, Lady of the Lake. Stevenson, Treasure Island. Practice Composition. Exercises.

Course 14. English.

Five Hours, One Semester.

Precepts: Donnelly's Imitation and Analysis. Authors: Shakespeare, Julius Caesar; Cooper, The Spy. Practice: Composition. Exercises.

Course 15. Religion.

Two Hours, One Semester.

Christian Doctrine. Text: Kinkead's Explanation of the Baltimore Catechism, second half.

Course 16. Religion.

Two Hours, One Semester.

Christian Doctrine. Text: De Harbe, Full Catechism of the Christian Religion, Part II.

Course 17. Mathematics.

Five Hours, One Semester.

Algebra to Quadratics reviewed. Text: Wells' Algebra.

Course 18. Mathematics.

Five Hours, One Semester.

Algebra from Quadratics to end. Text: Wells, Algebra.

Course 19. History.

Five Hours, One Semester.

Medieval History. Fredet's Medieval and Modern History.

Course 20. History.

Five Hours, One Semester.

Modern History. Text: Fredet's Medieval and Modern History.

Third Year.

Course 21. Latin.

Eight Hours, One Semester.

Precepts: Syntax. Authors, Cicero, first three orations against Cataline. Practice: Themes in Imitation.

Course 22. Latin.

Eight Hours, One Semester.

Precepts: Syntax. Authors: Cicero's Fourth Oration against Cataline, the orations Pro Archia and Pro Marcello. Practice: Themes in Imitation. Original Exercises.

Course 23. English.

Five Hours, One Semester.

Precepts: Text: Scott & Denney's New Composition-Rhetoric. Authors: Gray, Poems, Parkman, Oregon Trail; Arnold, Sohrab and Rustum. Practice: Composition, Written exercises.

Course 24. English.

Five Hours, One Semester.

Precepts: Text: Scott & Denney's New Composition-Rhetoric. Authors: Shakespeare, Merchant of Venice. Hughes, Tom Brown's School Days. Practice: Composition, Written Exercises.

Course 25. Religion.

Two Hours, One Semester.

Christian Doctrine. Text: Deharbe, Full Catechism of Christian Religion, Part III.

Course 26. Religion.

Two Hours, One Semester.

Christian Doctrine. Text: Deharbe, Full Catechism of Christian Religion, Part I.

Course 27. Mathematics.

Five Hours, One Semester.

Plane Geometry. Albegraic Applications. Text: Wentworth, Plane Geometry.

Course 28. Mathematics.

Five Hours, One Semester.

Plane Geometry. Albegraic Applications. Text: Wentworth, Plane Geometry.

Course 29. History.

Five Hours, One Semester.

History of England. Text: Birt's Abridgment of Lingard.

Course 30. History.

Five Hours, One Semester.

History of England. Text: Birt's Abridgment of Lingard.

Course 31. Greek.

Three Hours, One Semester.

Precepts: Etymology and Syntax. Text: White's First Greek Book. Practice: Themes.

Course 32. Greek.

Three Hours, One Semester.

Precepts: Etymology and Syntax. Text: White's First Greek Book. Xenophon's Anabasis, two books Lucian's Dialogues. Practice: Translation of sentences based on the authors.

Fourth Year.

Course 33. Latin.

Five Hours, One Semester.

Precepts, Syntax. Authors: Cicero, De Senectute. Virgil Three Books. Practice, Themes in Imitation. Original Exercises. Bradley's Edition of Arnold's Latin Composition. Easy Latin Conversation.

Course 34. Latin.

Five Hours, One Semester.

Precepts: Prosody. Authors: Cicero, Narrations, Vir-

gil, Three Books. Practice: Themes in Imitation. Original Exercises. Bradley's Edition of Arnold's Latin Prose Composition. Easy Latin Conversation.

Course 35. English.

Four Hours, One Semester.

Precepts: Text: Blaisdell's Composition-Rhetoric. Authors: Macaulay, Johnson; Shakespeare, Macbeth; Browning, Poems. Practice: Composition. Exercises in simpler forms of verse.

Course 36. English.

Four Hours, One Semester.

Precepts: Text: Blaisdell, Composition-Rhetoric. Authors: Tennyson's Idylls of the King, Shakespeare's Henry V. Practice: Composition. Exercises in simpler forms of verse.

Course 37. Religion.

Two Hours, One Semester.

Christian Doctrine. Text: Gibbons, Faith of Our Fathers, first half.

Course 38. Religion.

Two Hours, One Semester.

Christian Doctrine. Text: Gibbons, Faith of Our Fathers, second half.

Course 39. Mathematics.

Five Hours, One Semester.

Solid Geometry. Text: Wentworth, Plane and Solid Geometry.

Course 40. Mathematics.

Five Hours, One Semester.

Plane and Spherical Trigonometry. Text: Wentworth.

Course 41. History.

Five Hours, One Semester.

History of the United States. Text: Montgomery, American History.

Course 42. Civil Government.

Five Hours, One Semester.

The Government of the village, town and city. Activities and duties of the citizen. The State and Federal Governments. Text: Hinsdale, The Civil Government.

Course 43. Physics.

Five Hours, One Semester.

A course in elementary Physics with copious laboratory experiments. Text: Milliken & Gale, First Course in Physics. Also Milliken & Gale, Laboratory Course in Physics.

Course 44. Physics.

Five Hours, One Semester.

A continuation and completion of Elementary Physics. Text: Milliken & Gale, First Course in Physics. Also Milliken & Gale, Laboratory Course in Physics.

Course 45. Greek.

Five Hours, One Semester.

Review of Etymology and Syntax: White's Begin-

ner's Greek Book. Author: Homer, The First Book of the Iliad and one-half of the Second. Practice: Exercises in translating from English into Greek.

Course 46. Greek.

Five Hours, One Semester.

Etymology and Syntax. Text: White's Beginner's Greek Book. Author: Homer, The last half of the Second Book of the Iliad., the Third Book. Practice: Exercises in translating from English into Greek.

GENERAL PROVISIONS FOR HIGH SCHOOL OR PREPARATORY DEPARTMENT.

Greek is required only for those students who intend to proceed to the degree of Bachelor of Arts.

Physics is required of students preparing to enter the College of Engineering and the College of General Science.

Commercial branches (twenty hours) may by special arrangement be taken after the first year of the preparatory school. This is not, however, recommended in the case of students who intend to enter University courses.

Modern Languages (three hours) may be elected during the last two years of the preparatory course.

For information as to Written Work, Attendance, Examinations, Promotion, Conditions, Failures, etc., see **"General Provisions Regarding Scholarship and Standing," elsewhere in this catalogue.**

HIGH SCHOOL OR PREPARATORY DEPARTMENT

FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR	
Subject	Hrs.	Subject	Hrs.	Subject	Hrs.	Subject	Hrs.
Latin	8	Latin	8	Latin	8	Latin	4
English	5	English	6	English	6	English	4
Religion	2	Religion	2	Religion	2	Religion	2
Algebra 1st year	5	Algebra, 2d year	5	Plane Geometry	5	Solid Geometry 1st sem.	5
Ancient History	5	Modern and Medieval History	5	History of England	5	Plane Trignometry 2d sem.	5
				Greek	5	Greek, 1st sem.	5
				Mod. Language	3	Civics History of U. S. 2d sem.	5
						*Physics	5
						Mod. Language	3

THE ANNUAL RYLAND DEBATE

between

The Philalethic Senate

and

The House of Philhistorians

Friday evening at 8:15 o'clock, May 15, 1914.

THE QUESTION

Resolved: That the American Ships Engaged in Coastwise Trade, and Passing Through the Panama Canal, Shall Not Be Exempt From Paying Tolls For the Use of the Canal.

PROGRAM

OVERTURE — University Orchestra

INTRODUCTORY — Mr. James P. Sex, Chairman

DEBATE

Affirmative — **Philalethic Senate**

Senator Rodney A. Yoell, '14.
Senator Harold R. McKinnon, '14.
Senator Harry W. McGowan, '13.

Negative — **House of Philhistorians**

Representative Miles A. Fitzgerald, 15
Representative Wm. Stewart Cannon, '16
Representative George A. Nicholson, '16.

SELECTION — University Orchestra

DECISION OF JUDGES

FINALE — University Orchestra

Judges.

Mr. John W. Ryland — Hon. James H. Campbell
Hon. William A. Beasly, — Mr. Clarence C. Coolidge
Mr. Owen D. Richardson.

WON BY THE PHILALETHIC SENATE.

ANNUAL ELOCUTION CONTEST

Friday Evening, May 29, 1914.

OVERTURE, "Black Queen" White
University Orchestra.

INTRODUCTORY REMARKS
Harry W. McGowan, A. B. '13

FOR THE JUNIOR ELOCUTION PRIZE

High School.

"The Legend of the Organ Builder"—Dorr
Mark A. Falvey, '15

"The Old Surgeon's Story"—Donnelly
Cyril R. Kavanagh, '16

"Smiting the Rock"—Anonymous
Peter H. Cunningham, '16

"The Song of the Market Place"—Buckham
James J. Lyons, '14

MARCH—"SEVENTH REGIMENT" White
UNIVERSITY ORCHESTRA

"The Baron's Last Banquet"—Greene
Francis W. Schilling, '15

"King Robert of Sicily"—Longfellow
Robert E. Tremaine, '14

"The Station Master's Story"—Price
Thomas J. Ford, '16

"McClean's Child"—McKay
Horace B. Wilson, '15

VALSE—"LANGAGE DES FLEURS" Roberts
UNIVERSITY ORCHESTRA.

FOR THE OWL PRIZE.

University

"The Martyrdom of Pancratius"—Wiseman
Nicholas J. Martin, '16

"The Gladiator"—Fenno
Edward B. Ford, '15

"The Miser"—Osborne
Joseph R. Aurrecoechea, '17

"The Leper"—Willis
Adolph B. Canelo, '15

FINALE—"KANSAS CITY STAR" Liberati
UNIVERSITY ORCHESTRA.

Judges.

Hon. P. F. Gosbey, Hon. James H. Campbell
Nicholas Bowden, Esq. James P. Sex, Esq.

THE

SIXTY-THIRD ANNUAL COMMENCEMENT

of the

UNIVERSITY OF SANTA CLARA.

Wednesday Afternoon at Two o'clock, June 10, 1914.

PROGRAMME

Overture—"The Golden Sceptre" Schlepegrell
The University Orchestra.

Award of Prizes

Conferring of Degrees

"When Knighthood Was in Flower" Gustin
The University Orchestra.

Valedictory
Harry W. McGowan, A. B. '13, LL.B. '14

"Seventh Regiment March" White
The University Orchestra.

Address
The Right Rev. Edward J. Hanna, D. D.

Finale—"Our Director" Bigelow
The University Orchestra.

DEGREES CONFERRED

Doctor of Philosophy.

GEORGE LEONARD SULLIVAN, B. S., M. E.

Bachelor of Laws.

ERVIN SAMUEL BEST
FRANK GRIFFIN BOONE
ROYAL ANDREWS BRONSON, A. M.
CHRISTOPHER ALOYSIUS DEGNAN, A. B.
DION RAPHAEL HOLM, A. B.
JOHN JOSEPH JONES, A. B.
HARRY WILLIAM McGOWAN, A. B.
ALBERT JOSEPH NEWLIN, B. S.
CHAUNCEY FRANCIS TRAMUTOLO, B. S.
EDWARD GERALD WHITE, B. S.
STEPHEN MALLORY WHITE, A. B.
MARCO SAMUEL ZARICK, B. S.

Bachelor of Arts.

ADOLPH JOHN BAIOCCHI
VICTOR ANTHONY CHARGIN
JOHN MARTIN CONCANNON
HAROLD RICHERT McKINNON

Bachelor of Science.

BENJAMIN ROLLER HEWITT

Bachelor of Letters.

RODNEY ALEXANDER YOELL

Bachelor of Science in Architecture.

BERT MELLOTT HARDY

Mining Engineer.

JOHN DIXON HUBBARD

COMMERCIAL CERTIFICATES

Were Awarded to

JOSEPH LAWRENCE CABRAL
CHARLES JOHN DREES
FRANCIS XAVIER DOUGHERTY
LEO EBERHARD HOLTHOUSE
PETER BLAS MARINOVICH
BENJAMIN ERLE SCHNEREGER

EXTRAORDINARY PRIZES

THE SENIOR NOBILI MEDAL

An annual prize of $60, founded in 1876, by Joseph A. Donahue, Esq., of San Francisco, in honor of the First President of Santa Clara, the Rev. John Nobili, S. J., to be given to "the student who shall be deemed first in morals, obedience, and application to study," was awarded to

WILLIAM THOMAS SHIPSEY.

Next in Merit:

JAMES DANIEL COYLE.

Distinguished:

Thomas Charles Boone
Thomas Concannon
William Joseph Christy
Nicholas Joseph Martin
David Burris Draper
James Joseph Lyons
John Martin Concannon
James Peter Fitzpatrick
George Aloysius Nicholson
Leo John Lucas
Frank Emmett Browne
Ernest William Schween
Benjamin Erle Schnereger
Arthur Wellesley Olcott
John Rudolph O'Neill
Ralph Julius Weyand

THE JUNIOR NOBILI MEDAL

An annual prize of $25 founded in 1898 by Michael H. Kelly, Esq., of San Francisco, to be given to the "student in the junior division who shall be deemed first in morals, obedience and application to study", was awarded to

MARK ANTHONY FALVEY.

Next in Merit:

HERMAN CHARLES DIERINGER.

Distinguished:

Thomas Joseph Conneally
Leonard Stephens Salter
Walter Francis Garcia
Cyril Robert Kavanagh
Gilbert Edward Haskamp
Ignacio John Forster
Francis Michael Conneally
Benjamin Tully Williams
Joseph Irving Edinger
Arthur Aloysius Falvey

THE ARCHBISHOP'S MEDAL

An annual prize of $50, donated by His Grace, the Most Reverend Patrick W. Riordan, D. D., Archbishop of San Francisco, "for the best examination in Christian Doctrine," was awarded to

WILLIAM ALLEN IRWIN, JR.

Distinguished:

Adolph Briones Canelo
Ernest William Schween
Louis Thomas Milburn

THE RYLAND PRIZES

Annual prizes of $50, $15 and $10, founded in 1897 by the Hon. Caius T. Ryland of San Jose, and increased by his son John W. Ryland, Esq., to be given "to the student who may be deemed by the University most fit for the prize," have been set aside for the students who shall be judged to have distinguished themselves most in the Ryland Annual Debate between the Philalethic Senate and the House of Philhistorians, and were awarded as follows:

First Prize, Fifty Dollars

HARRY WILLIAM McGOWAN, A. B., LL. B.

Second Prize, Fifteen Dollars

HAROLD RICHERT McKINNON, A. B.

Third Prize, Ten Dollars

GEORGE ALOYSIUS NICHOLSON

Distinguished:

Miles Aloysius Fitzgerald Rodney Alexander Yoell

THE BARCHI PRIZES

Annual prizes of $15 and $10, founded by Joseph M. Durney, Esq., of San Francisco, in honor of the Rev. Caesar A. Barchi, S. J., were given this year for the best paper in the Mathematical Contest, and were awarded as follows:

First Prize, Fifteen Dollars

WILLIAM KEVIN CASEY

Second Prize, Ten Dollars

THOMAS RICHARD DANIEL FOX

Distinguished:

William Ignatius McElligott.

THE OWL MEDAL

An annual prize of $25, founded by the directors of the former University magazine, "The Owl", to be given to

the winner of the Annual Elocution Contest in the University courses, was awarded to

ADOLPH BRIONES CANELO

Distinguished:

Nicholas Joseph Martin Joseph Ramon Aurrecoechea
Edward Byron Ford

THE JUNIOR ELOCUTION MEDAL

An annual prize of $25 for the winner of the Elocution Contest in the High School Department was awarded to

FRANCIS WALTER SCHILLING

Distinguished:

Horace Bertram Wilson Mark Anthony Falvey
Cyril Robert Kavanagh Robert Edward Tremaine

THE DONOHOE MEDAL

An annual prize of $50 to be awarded to the student who shall show the greatest progress in the study of Latin and Greek during the session, was set aside this year for the best Latin composition and was awarded to

ARTHUR VALENTINE SAMANIEGO

Next in Merit:

RICHARD IGNATIUS McCARTHY

Distinguished:

Norbert Joseph Korte George Aloysius Nicholson
Joseph Lawrence Cabral William Kevin Casey

THE REDWOOD PRIZES

Annual prizes of $15 and $10, founded in 1908 by the executive committee of "The Redwood," the Student Body publication, was set aside this year for the best essay on a historical subject, and was awarded as follows:

First Prize, Fifteen Dollars
WILLIAM ALLEN IRWIN, JR.

Second Prize, Ten Dollars
DEMETRIO DIAZ

Distinguished:
Oscar Lee Oliver.

THE McCANN PRIZES.

Annual prizes of $15 and $10, founded in 1894 in memory of Daniel J. McCann, B. S. '84, was set aside this year for the best short story, and was awarded as follows:

First Prize, Fifteen Dollars
FRANCIS BUCKLEY McGURRIN

Second Prize, Ten Dollars
EDWARD LORIGAN NICHOLSON

Distinguished:
James Charles Murphy Francis Walter Schilling
Oscar Lee Oliver

The Silver Medal for Conduct and Application
To be given to the most distinguished of the
RESIDENT UNIVERSITY STUDENTS
was awarded to
JAMES DANIEL COYLE

The Silver Medal for Conduct and Application
To be given to the most distinguished of the
NON-RESIDENT UNIVERSITY STUDENTS
was awarded to
PAUL COLIN CAMPBELL.

The Silver Medal for Conduct and Application
To be given to the most distinguished of the
RESIDENT HIGH SCHOOL STUDENTS
was awarded to
HERMAN CHARLES DIERINGER.

The Silver Medal for Conduct and Application
To be given to the most distinguished of the
NON-RESIDENT HIGH SCHOOL STUDENTS
was awarded to
JAMES EDWARD CLARKE.

THE ORELLA MEDAL

A prize of $25, founded by Dr. Firmin R. Orella, B. S. '89, to be given to the writer of the best paper on a scientific subject, was awarded to

WILLIAM DIRVIN LOTZ

Distinguished:
Howard Francis Barzen.

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Also a solar spectroscope.

To the Ryland Prize for Debating—An annual addition of $15 for second prize and $10 for third prize.

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REGISTER OF ALL STUDENTS

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Jr.—Junior.
Let.—Letters, College of Letters and Sciences.
Pre-Med.—Pre-Medical.
Res.—Resident, living within the University.
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Spec.—Special, not in regular course.
Sr.—Senior.

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Butler, Henry Joseph	1 High	Res.	San Francisco
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Callahan, Raymond Walter	3 High	Res.	San Francisco
Camarillo, Frank Adolph	3 High	Res.	Camarillo
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Cannon, William Stewart	Soph. Let.	Res.	San Francisco
Carberry, James Malachi	3 High	Res.	San Francisco

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Casey, Harry Francis	2 High	Res.	San Lucas
Casey, Thomas Francis	3 High	Res.	San Mateo
Casey, William Kevin	2 High	Res.	San Francisco
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Cavanaugh, Edward Henry	3 High	Res.	Oakland
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Chargin, Victor Anthony	Sr. Let., Pre-Med.	Ext.	San Jose
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Christy, William Joseph	Soph. Engr.	Res.	San Francisco
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Col, Louis	Fresh. Sci.	Ext.	San Jose
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Concannon, Thomas	Soph. Engr.	Res.	Livermore
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Conneally, Thomas Joseph	2 High	Res.	Los Angeles
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Coschina, Emil Orpheus	Sr. Let. Spec. 2 Law	Ext.	San Jose
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Daly, Michael Raymond	3 High	Res.	San Francisco
Dana, Elisha Colt	2 High	Res.	Nipomo
Degnan, Christopher Aloysius A. B. '12	3 Law	Ext.	San Francisco

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Dieringer, Herman Charles	2 High	Res.	Austin, Nev.
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Di Fiore, Leopold Pasquilino	3 High	Ext.	San Jose
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Donovan, Osmond Daniel	3 High	Res.	Half Moon Bay
Doran, William Patrick	2 High	Res.	Fairbanks, Alas.
Doud, Harry Francis	2 High	Res.	Monterey
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Doyle, George Gregory	3 High	Res.	San Diego
Draper, David Burris	Soph. Let.	Res.	San Jose
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Eisert, Richard Henry	1 High	Res.	San Francisco
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Falvey, Mark Anthony	3 High	Res.	San Mateo
Faught, Roy Kingdom	1 High	Res.	San Francisco
Fitzgerald, Miles Aloysius	Soph. Let.	Res.	San Luis Obispo
Fitzpatrick, Francis John	Fresh. Engr.	Res.	San Luis Obispo
Fitzpatrick, James Peter	Jr. Let. 1 Law	Res.	Los Angeles
Fitzpatrick, John Herman	Coml. 1 High	Res.	San Francisco
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Fitzpatrick, William Benjamin	Soph. Let.	Res.	San Luis Obispo
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Geoghegan, Rudolph Francis	3 High	Res.	Salt Lake City, Utah
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Gianella, William Augustus	3 High	Res.	Honcut, Butte Co
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Griffith, Michael Edward A. B. '98	1 Law	Ext.	San Jose

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O'Connor, Lawrence P.	Soph. Spec.	Res.	San Francisco
O'Connor, Oscar Bartholomew	1 High	Res.	San Francisco
Ojeda, Eugene Walter	1 High	Res.	Tres Pinos
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Oliver, John Connor	1 High	Res.	Los Altos
Oliver, Oscar Lee	Fresh. Let.	Res.	Merced
O'Neil, Ignatius Patrick	Soph. Engr.	Res.	Los Angeles
O'Neil, John Thomas	Coml.	Res.	Los Angeles
O'Neill, Edward Alexander	4 High	Res.	Soquel
O'Neill, John Rudolph	3 High	Res.	Soquel
Otero, Oscar Leonard	1 High	Res.	Long Beach
Pacheco, Benjamin Lugardo	Soph. Engr.	Res.	San Rafael
Parra, George Victor	2 High	Res.	.....
Perkins, George Bradbury	2 High Coml.	Res.	Grass Valley
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Petersen, Elmer Thomas	1 High	Res.	San Jose

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Roche, John Thomas	2 High	Ext.	Menlo Park
Ryan, Daniel James	4 High	.....	Novato
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Schnereger, Benjamin Erle	4 High, Coml.	Res.	Hanford
Scholz, Rudolph John	4 High	Res.	Medford, Ore.
Schupp, Charles Edward	4 High	Res.	Davenport, Ia.
Schween, Ernest William	4 High, Coml.	Res.	Pleasanton
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Shaw, D. Albert	4 High	Res.	Hollister
Sheehan, Leslie Maurice	Coml.	Res.	Sacramento
Sheehan, William Aloysius	2 High	Ext.	Burlingame
Sheehy, John Frederick	Jr. Let. 1 Law	Res.	Watsonville

Shipsey, William Thomas	Jr. Let. 1 Law	Res.	San Luis Obispo
Simas, Eugene Maderas	3 High, Coml.	Res.	Santa Clara
Smith, Laurence Walter	3 High	Res.	Big Pine
Somps, George Peter	3 High	Res.	Oakland
Soto, Earl	Fresh. Let.	Res.	Martinez
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Sparks, Thomas Albert	2 High	Res.	Winters
Speciale, Orvis	Soph. Let.	Ext.	San Jose
Sperry, Thomas Alexander	1 High	Ext.	San Jose
Spotorno, Edward William	2 High	Res.	San Francisco
Stanfield, John Harold	Soph. Engr.	Ext.	Campbell
Steiger, Adolph Louis	3 High	Res.	San Francisco
Sternes, George Duncan	Coml.	Res.	Yuba City
Stewart, Archibald P.	Jr. Engr.	Ext.	San Jose
Stewart, Francis Herbert	Fresh. Arch.	Res.	San Jose
Stewart, Ronald Grant	Fresh. Let.	Ext.	San Jose
Sullivan, William Ward	3 High	Ext.	Santa Clara
Taforo, Leo Joseph	2 High	Ext.	Santa Clara
Terrazas, Abel Jose	1 High	Res.	Chihuahua, Mex.
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Tighe, William Charles	1 High	Res.	Oakland
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Traynham, Donald P.	4 High	Res.	College City
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Tustin, John Leonard	Fresh. Spec.	Ext.	San Jose
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Twohy, Philip Joseph	Jr. Let., 1 Law	Res.	Spokane, Wash.
Uhl, Edwin Howard	3 High	Res.	Vacaville

Van Leeuwen, Earl George	Jr. Engr.	Ext.	San Jose
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Vejar, Rudolph Goss	3 High	Res.	Los Angeles
Voight, Guy	Jr. Engr.	Res.	San Diego
Volkers, William Keith	3 High	Ext.	San Jose
von Raesfeld, Goswin Paul	Coml.	Ext.	San Jose
Wallis, Ivor Edgar	Fresh. Spec.	Res.	Marysville
Walsh, Edwin Martin	Soph. Let.	Res.	Menlo Park
Walsh, Martin Simon	1 High, Coml.	Ext.	Santa Clara
Watson, Joseph Walter	Coml.	Res.	East Highlands
Weyand, Ralph Julius	Fresh. Engr.	Res.	Colusa
Whelan, Harry Gabriel	Soph. Let., Spec.	Res.	Burlingame
White, Benjamin Alvin	3 High, Coml.	Res.	Los Angeles
White, Edward Gerald B. S. '12	3 Law	Ext.	Watsonville
White, Stephen Mallory A. B. '13	3 Law	Ext.	Watsonville
Widemann, Honore Alfred	2 High, Coml.	Res.	Mountain View
Willey, Frank Allen	1 Law	Ext.	San Jose
Williams, Benjamin Tully	1 High	Res.	Oxnard
Williams, Roy John	Coml	Ext.	Campbell
Wilson, Horace Bertram	3 High	Res.	San Francisco
Winston, James Wallace	4 High	Res.	Duarte
Wood, Howard Vincent	1 High	Res.	San Francisco
de Ybarrondo, Thomas Bartholomew	Pre-Med., Jr. Let.	Res.	Los Angeles
Yoell, Rodney Alexander	Sr. Let., Pre-Med.	Res.	San Jose
Zarick, Marco Samuel B. S. '12	3 Law	Ext.	Sacramento

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